

FLORIDA HIGHWAYS

Published by the State Road Department

Vol. VI

No. 10



U. S. Highway No. 90 Crosses Chipola River in Jackson County.

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October, 1929

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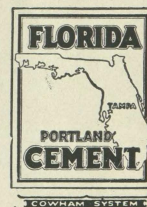
State Highway Specifications

DAILY

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CAPACITY

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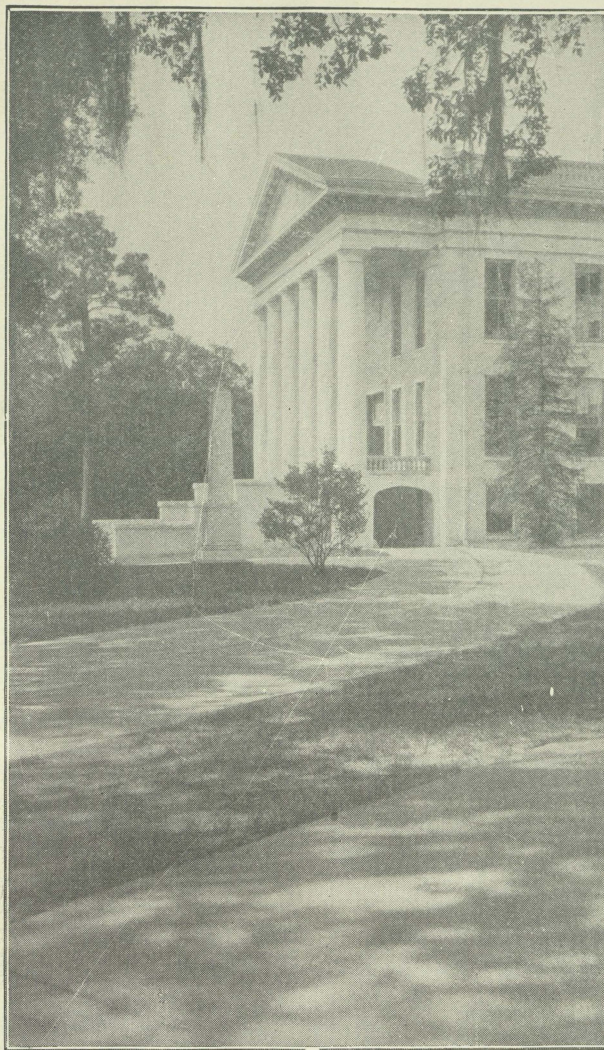
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Tampa, Florida

FLORIDA

Vol. VI
No. 10



HIGHWAYS

OCTOBER
1929

Two Southern Highways Available for Coast-to-Coast Motoring

U. S. Routes 80 and 90 Traverse Country Rich in Agricultural and Industrial Development and Full of Historical Interest.

IN a series of historical and geographical sketches of the various important highways of the country, the Bureau of Public Roads of the United States Department of Agriculture describes the two southern cross-country routes designated by Federal and State authorities as United States Highways 80 and 90.

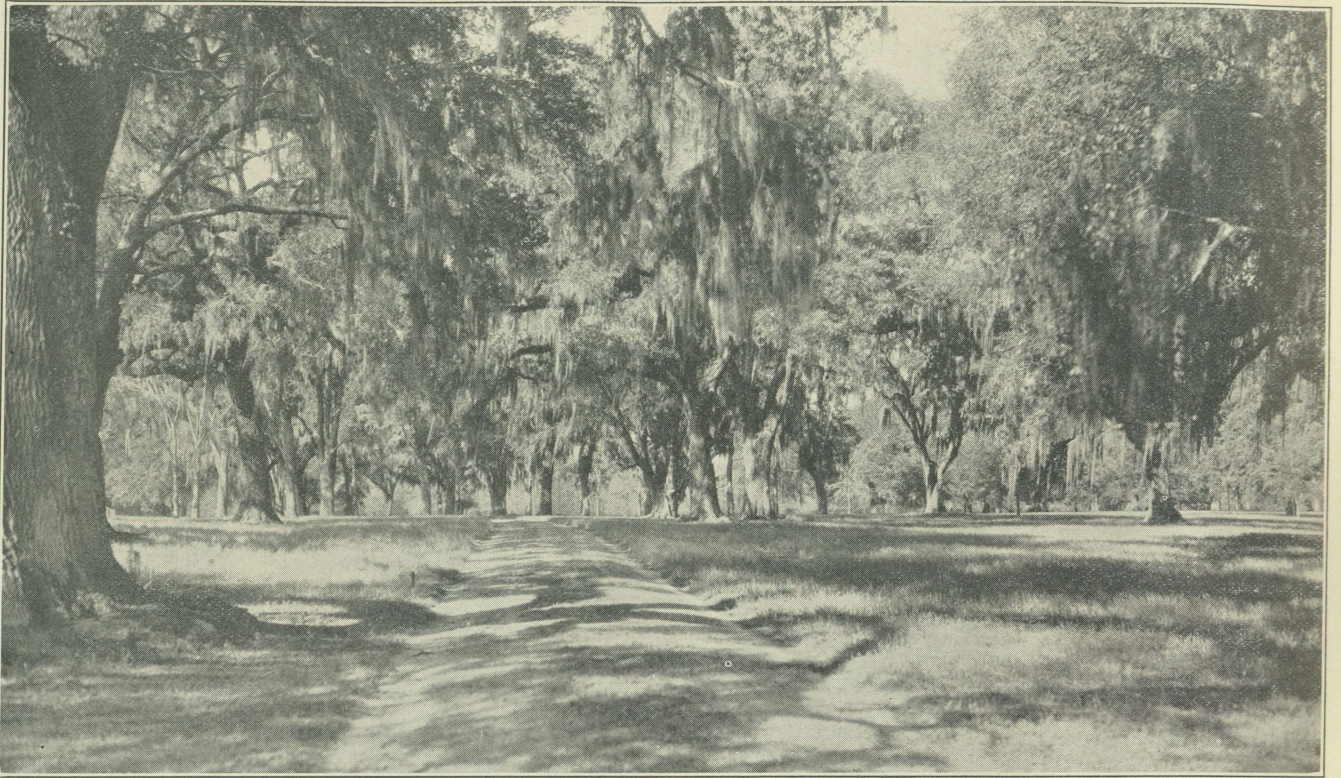
These two highways, stretching from coast to coast across the southern part of the country, are pictured as resembling "a two-pronged fork with the tines pointing east." Route 80 begins at Savannah, Ga., and Route 90 at Jacksonville, Fla., the two "tines" extending westward to join each other at Van Horn in the hill country of West Texas. There Route 90 ends and Route 80 continues westward alone, carrying

the traffic of the two routes on to San Diego on the West Coast.

UNITED STATES ROUTE 90

From Jacksonville, Florida, to Van Horn, Texas.

United States Highway 90 begins at Jacksonville, Florida, at the gateway to the winter resort area on the eastern coast, some 42 miles above St. Augustine, the oldest city in the United States, and the beginning of things Spanish on the Atlantic shores. It traverses the northern part of Florida, follows the Gulf of Mexico through the deep-water seaports of Alabama, Mississippi and Louisiana, and continues through the bayou district and the rice and sugar fields of Louisi-



Off the Main Highway Among the Live Oaks Along U. S. Highway No. 90.

ana and the oil fields and cattle land of Texas to join Route 80 at Van Horn in west Texas.

The highway follows the trail of the Spanish explorers Ponce de Leon, De Narvaez, De Luna, De Soto and Cabeza de Vaca, and of the missionaries, who established churches in Florida, Georgia, Texas, New Mexico, Arizona and California. The whole gulf coast along which it travels, with its camping, hunting and

fishing facilities, is fast becoming a winter playground for the Nation. The highway crosses numerous streams and bays that carry waters of half of the North American continent into the Gulf of Mexico; and bridge and road construction over swamps and delta sections have entailed some difficult engineering and financial problems.

The route parallels the southern transcontinental



U. S. Highway No. 90 in Gadsden County.



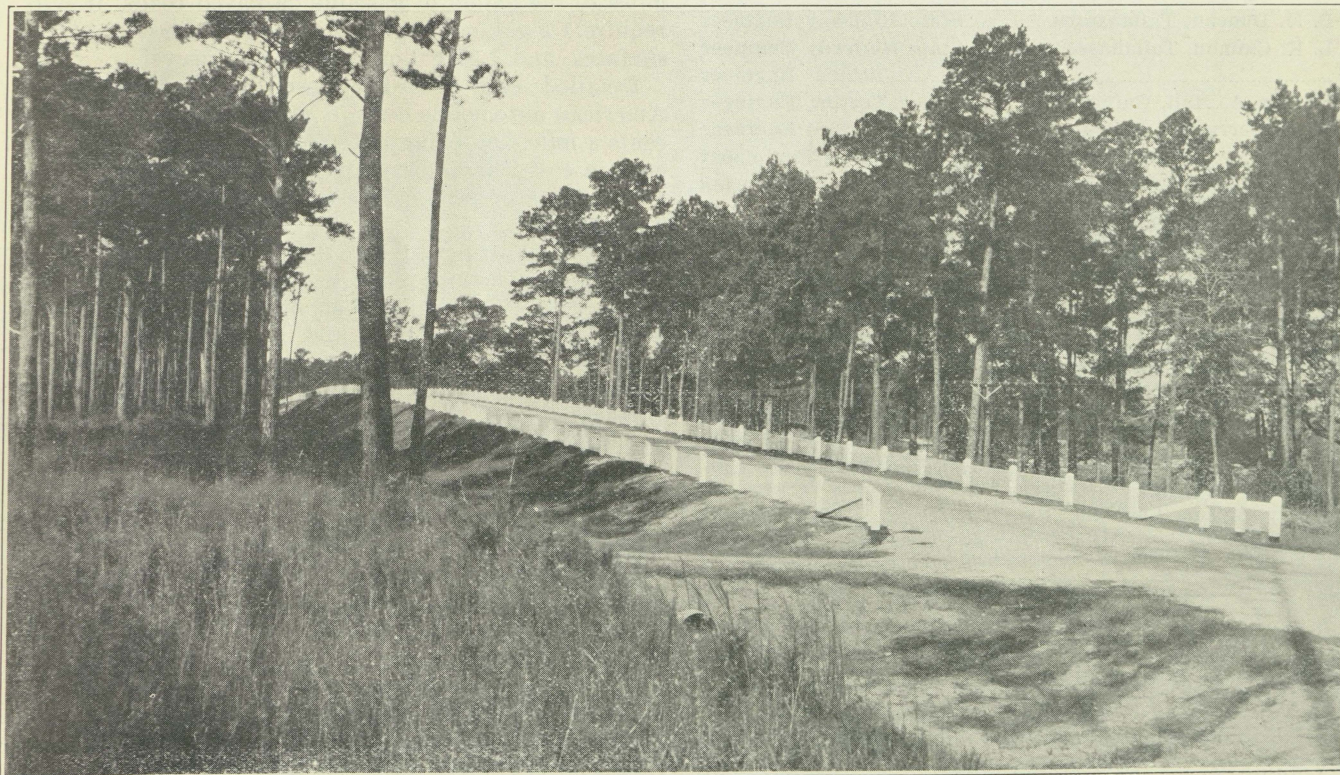
Headquarters of State Road Department at Tallahassee, on U. S. Highway No. 90.

Route 80 from Savannah to San Diego, as far as Van Horn, Texas. The two highways are separated by an average of 172 miles, and are intersected by numerous north-and-south Federal-aid roads. Route 90 practically coincides with the Old Spanish Trail through territory rich in old Spanish and French history. The majority of the old towns through which it passes retain some of the ancient Spanish and French

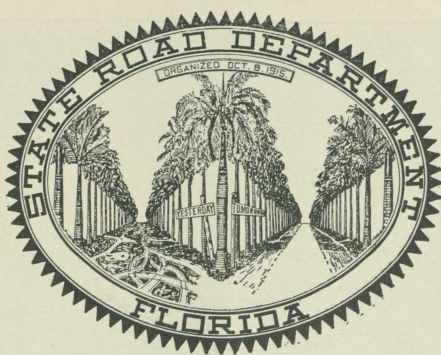
quarters and missions which are in striking contrast to their modern sections.

Route 90 has a total length of 1,621 miles, of which 615, or 38 per cent, are paved with brick, concrete or bituminous macadam, according to figures of the Bureau of Public Roads of the United States Department of Agriculture. Seven hundred and three miles,

(Continued on page 5.)



Overhead Crossing Near Wadesboro. U. S. Highway No. 90.



Florida Highways

Published Monthly
Official Publication of the State Road Department

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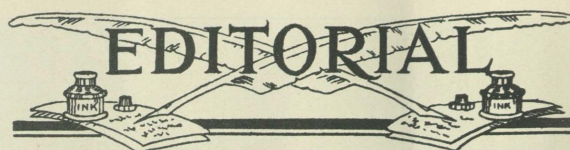
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THE VALUE OF GOOD ROADS

It is important not to overpay for good concrete highways, but it is also vastly important to have them, and this is an aspect of the matter which Florida taxpayers must bear in mind, groaning as they are under obligations incurred for road building.

There can be no question now, from the many reports which come in on all sides, that this season promises to be the best since the boom collapsed. There were more northern automobilists in Florida this summer than ever before during the warmer months. The motorists are coming in larger numbers earlier this fall than any previous season. The reasons seem to be two-fold. One is that the report has spread that Florida is no longer "holding up tourists" as it is reported to have done during the boom. The other is that the word is out: those awful roads through Georgia have partly (to Chicago and the Middle West) and almost entirely (to New York and the East) been replaced with concrete highway. And the reputation of Florida's remarkable highway system is spreading fast.

A survey made under the auspices of the American Road Builders' Association sheds some interesting light on what good roads pay the motorist quite aside from their value in facilitating means of communication and attracting tourists.

The survey shows, for example, that tractive resistance, which amounts to 2,000 pounds per ton when a car is mired, and 160 pounds per ton on soil and gravel roads, is reduced to 70 pounds per ton when the road is paved. Wind resistance may add slightly to these figures.

Tests showed that where a vehicle will travel 15 miles to the gallon of gasoline on paved roads, it will require 1.2 gallons to go the same distance on treated surfaces, and 1.47 gallons on soil and gravel.

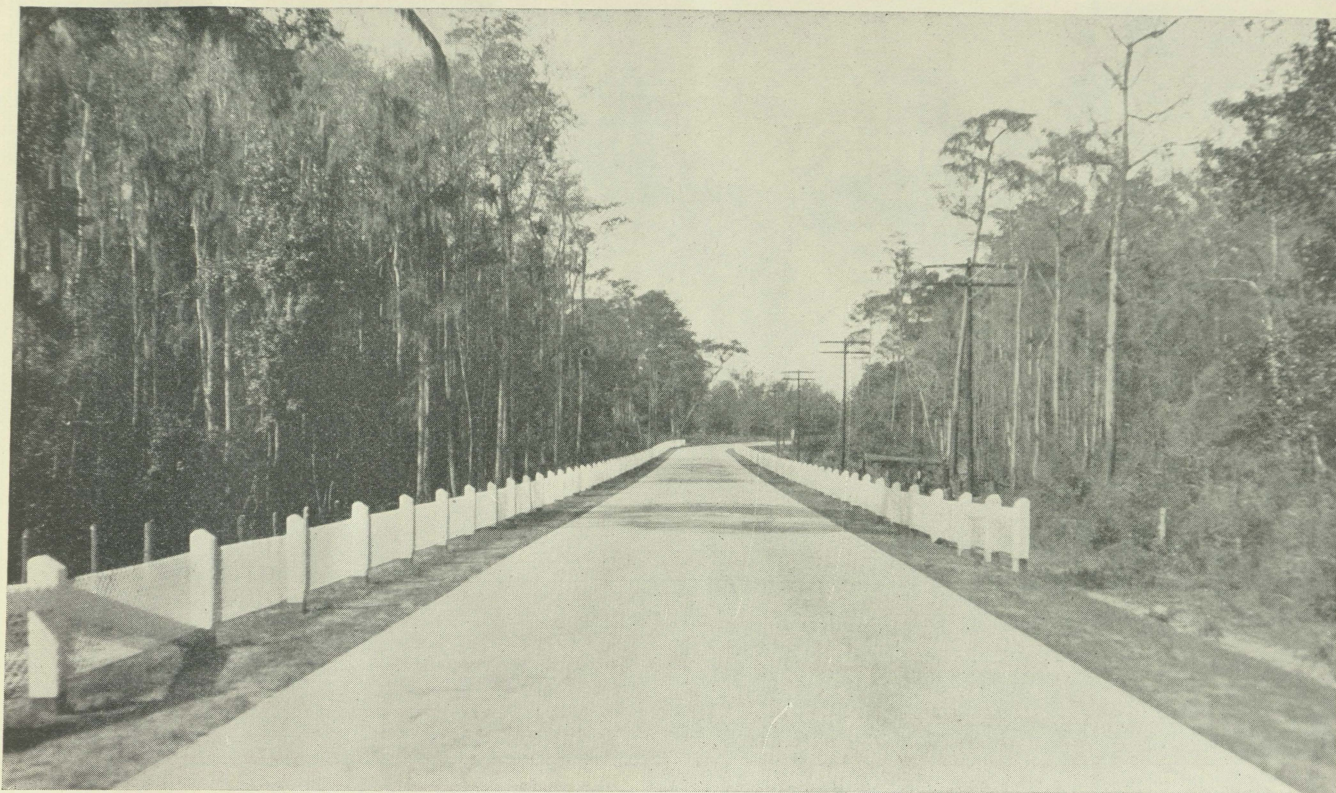
Detailed cost records showed that the average American automobile costs its owner from 6.02 to 9.45 cents a mile, according to the type of car. The difference in cost where gravel or soil roads are changed to a high type of paving is estimated at 2.06 cents per mile.

It is interesting to note that the saving Florida offers to tourists and residents alike through the excellent roads between all important places in the State easily offsets the gas tax which is imposed to pay the debts owed by counties and districts on these very roads.—Daytona Beach News-Journal.

GOOD ROADS AND AUTOMOBILES

"There is an interesting, well-defined and apparently highly logical relation between good roads and automobiles," says the Industrial Index. "In this country at least, where you find good roads you find cars, and vice versa. They go together like ham and eggs." This, it could be remarked, is citing the obvious; but it is something that should be mentioned often and with emphasis. The vice versa part is the most important to remember. Where the roads are poor there will be seen few cars. The drivers of the cars who are forced to travel over bad roads are the

(Turn to page 21.)



On U. S. Highway No. 90 in Jefferson County.

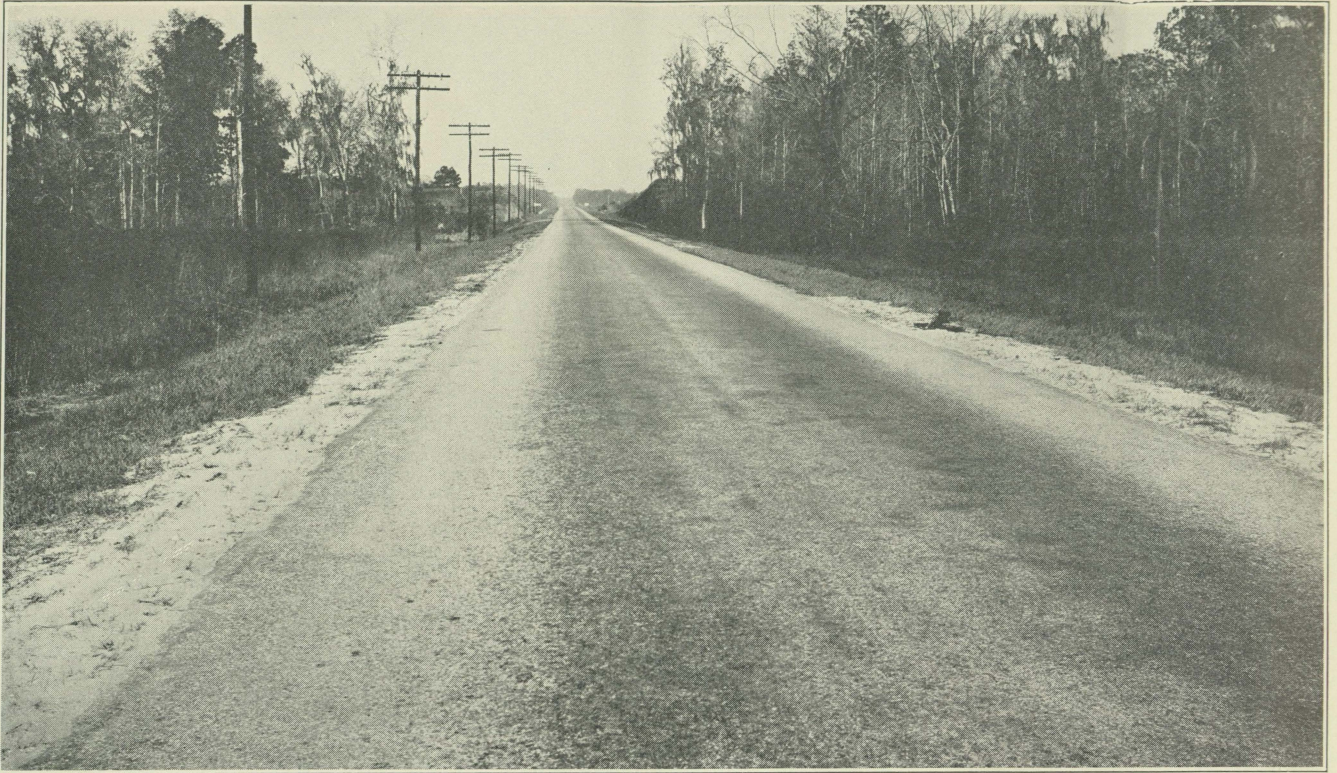
or 43 per cent, are surfaced with gravel, sand-clay and shell. This lighter construction, which climatic conditions favor, is adequate for present traffic. In some of the States, particularly in Florida, very successful methods have been developed for bituminous treatment of sand-clay and lime rock roads. One

hundred and sixty-three miles on Route 90, or about 10 per cent, are of graded and drained earth. Of unimproved roads, there are approximately 140 miles.

In the improvement of Route 90, the States have been helped materially by the Federal Government. Of the total mileage, 627 miles have been improved



U. S. Highway No. 90 in Jackson County.

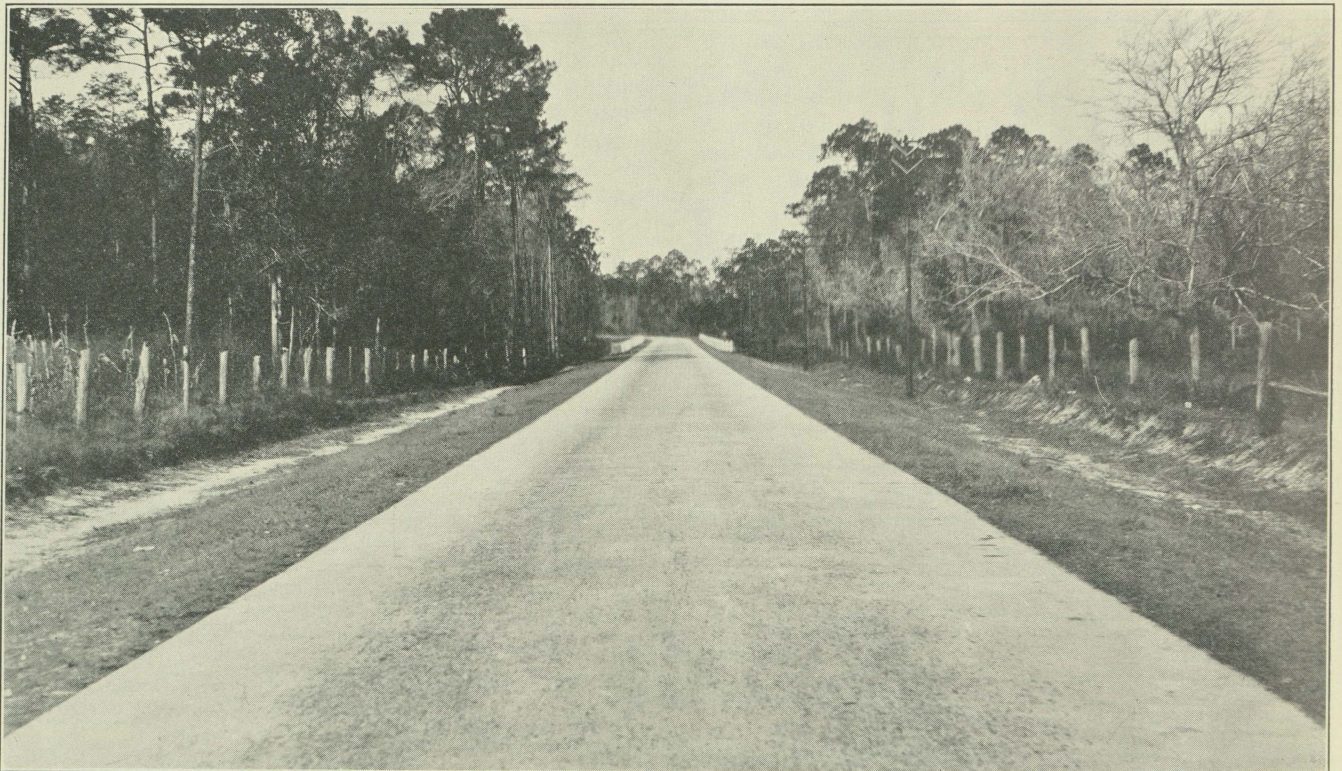


On U. S. Highway No. 90 in Madison County.

with Federal aid, at a total cost of \$15,967,986 of which the government contributed \$7,158,945, or about 45 per cent.

Jacksonville, well known as a tourist and industrial and commercial city, is on the St. Johns river, at the mouth of which Jean Ribault, heading a party of French Huguenots, landed in May, 1562. It is a

distribution headquarters for Florida and neighboring states, and is a great lumber and naval store market. It is the entryway to resorts south and to Cuba and Nassau. In Hemming Park, the city's plaza, is a tropical garden of great beauty. On the south side of St. Johns River bridge is an alligator and ostrich farm. Seventeen miles east of the city is Jacksonville



U. S. Highway No. 90, Jefferson County. Concrete.

Beach, 600 feet wide at low tide, a natural roadway as smooth as if it were paved, curving southward for forty miles. The beach is reached from Jacksonville over a concrete thoroughfare. Hecksher Drive follows the St. Johns river to the sea and connects with historic Fort George Island and Fort George Inlet, where fish of all kinds abound.

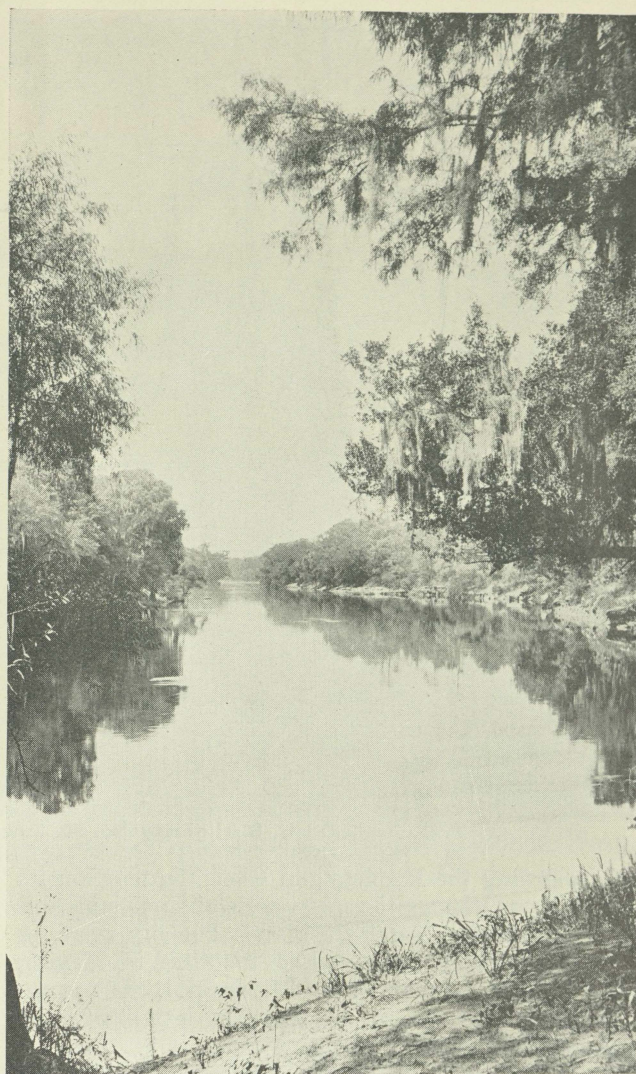
Some forty-two miles south, over United States Highway No. 1 which connects with Route 90, is St. Augustine, founded in 1565 by Pedro Menendez de Aviles. Narrow streets, old houses of Spanish architecture, ancient forts falling into decay, and the old city gates, tell of its early days. Fort Marion, at the end of a beautiful drive along the seawall, is a fine relic of the old Spanish dominion.

Leaving Jacksonville, Route 90 stretches westward through a rich agricultural section to Lake City and Live Oak, crosses the Suwannee river of song fame to Madison, and then continues through Monticello to Tallahassee, the Florida capital. Monticello is located in a farm and dairying district and is noted for its great melon seed production. It also has pecan nurseries and orchards. Tallahassee is situated in picturesque hill country and is surrounded by vast plantations with their beautiful Colonial mansions typical of the days before the Civil War. The land on which the city stands was purchased from the Indian chief, Tallahassee, arrangements being made by Andrew Jackson, then first Territorial Governor of Florida.

From Tallahassee, the road continues westward through Quincy, a producing and marketing center for shade tobacco and cigar wrappers, also noted for its fuller's earth mining; through Marianna, with its limestone deposits; through Ponce de Leon and De Funiak Springs to Pensacola. Ponce de Leon is named for perhaps the most romantic figure of all the Spanish hidalgos who came to the new world seeking fame and fortune. The sulphur springs of Ponce de Leon and De Funiak are said to be the goal which the Spanish adventurer was seeking. Ponce de Leon searched long years for the fabled Fountain of Youth, the magic spring which should bring back to middle and old age the verve and vigor of boyhood.

At Pensacola, a great deep water port, are naval and aviation stations of the government. Forts Pickens, McRae and Barrancas guard the entrance to the bay, and the Military Reservation is located close by on Santa Rosa Island. Two Spanish forts, San Carlos, built in 1696, and San Bernardino are still standing. The port of Pensacola handles enormous cargoes of cotton, cane and tobacco, which are brought down the Escambia river and its tributaries from the interior. De Luna landed at Pensacola Bay in 1559, with the largest expedition of all the Spanish explorers, but Indian enmity soon drove him to Vera Cruz.

From Pensacola, Route 90 stretches across the arm of Alabama which skirts the Gulf of Mexico and gives to the state its only seaport in Mobile. Mobile was founded by the French in 1711 when Fort Louis de la Mobile was located at the site of the city hall and armory. It takes its name from "Mauvila", Spanish form of the name of the Indian tribe whose valiant attack upon De Soto so nearly destroyed his expedition. Later Mobile fell under the rule of the Spaniards. While the French were at Mobile and the Spaniards at Pensacola, a Spanish outpost was located on



Famous Suwannee River, Just North of Bridge on U. S. Highway No. 90.

the eastern shore of Mobile Bay where the bridge now stands and the spot is still called Spanish Fort. The Battle House, on Royal street, marks the site of Andrew Jackson's headquarters in 1814. Mobile, with its port accommodating 29 steamship lines, the center of six railroads and with miles of convenient frontage for expansion, is in the midst of a fertile agricultural district. Five rivers, the Chickasaw, Tombigbee, Alabama, Apalachee and Tensas, which spread out like a fan, flow into Mobile Bay and bring cargoes of produce to her ports. Here also are fishing, hunting and water sports.

From Mobile, Route 90 runs parallel with the Gulf Coast to Biloxi, Mississippi, a favorite winter and summer resort, and noted for its seafood canning industry. This city, the first French settlement in Mississippi, founded in 1699, was for a time the seat of government of the Louisiana Province. A granite boulder marks the spot where d'Iberville first landed to establish the French settlement. Among other points of interest are "Beauvoir", the last home of Jefferson Davis, and now the Mississippi Confederate Veterans Home; and Fort Massachusetts, built by Federal forces during the Civil War.

The highway continues through Gulfport, a commercial city with a deep harbor; through Slidell; and will cross two free bridges, now in course of construe-



On U. S. Highway No. 90, Suwannee County, Near Live Oak.

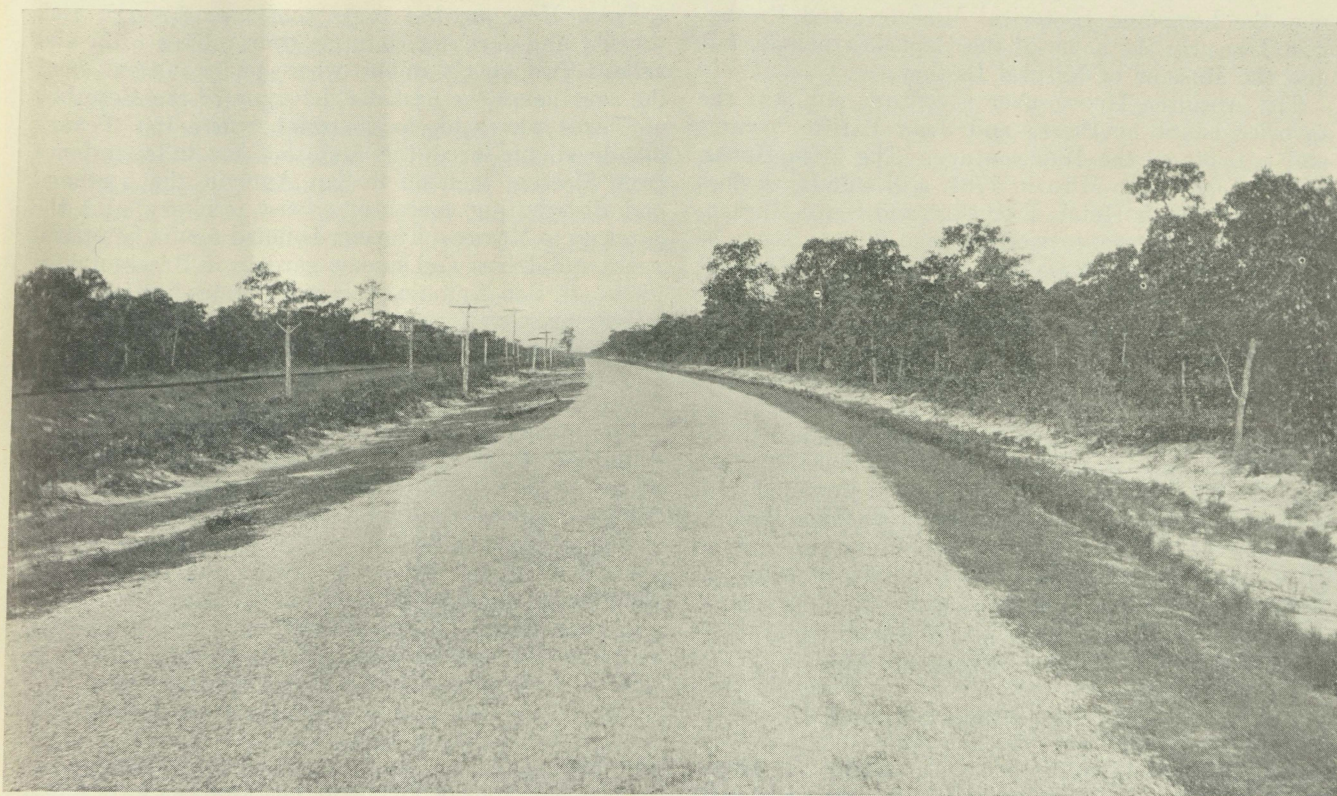
tion, spanning the Rigolets and Chef Menteur, on its way to New Orleans, the metropolis of Louisiana and one of the oldest cities in the state. The city averages about 5 feet above the level of the Gulf of Mexico, and lies in a crescent of the Mississippi. It is protected from overflows of the river by levees, in some places 20 feet high.

New Orleans is a great shipping center for one of the richest valleys in the world—the Mississippi—and has a large floating dry dock. It supports a cotton and sugar exchange, is a great rice and lumber trade center, and has numerous grain elevators. It is also famous for its Mardi Gras festivals.

The city was founded in 1718 by Sieur de Bienville,



U. S. Highway No. 90, Surface Treated Sand Clay, Holmes Creek.



Surface Treated Sand Clay, U. S. Highway No. 90, Okaloosa County.

the French explorer, and was named for the Duke of Orleans. When the Louisiana Purchase was made from France, this vast territory was formally transferred to the United States at New Orleans in 1803.

The modern section of the city is representative of the highest type of progressive industrial communities; the old French quarter, or Vieux Carre, is like no

other in the world, rich in romance and history and picturesqueness. Here are quaint old houses in the architecture of the Creole people, old shops, and a convent 200 years old. The Place d'Armes has been renamed Jackson Square. Facing the square are the Cathedral, one of the most historic churches in the country; the Cabildo, once the Spanish Court and



U. S. Highway No. 90, Madison County, Near Madison.

now the Louisiana Historical Museum; and Presbytere, formerly the home of the Capuchin priests, but now the Museum of Natural History.

The Absinthe House, over a century old, was the favorite haunt of Pierre and Jean Lafitte, pirates and patriots of the 18th century. The Miro House, built by Governor Miro in 1784, still stands, as does the old St. Louis Hotel; Exchange and Slave Market; Beauregard Square, formerly Congo Square, scene of Voodoo rites; the home and monument of General Beauregard, the great military engineer of Civil War fame; Boimare Bookshop and the French and Spanish Barracks.

Northwest of New Orleans, on the Mississippi, is Baton Rouge, the capital of the State, and one of the earliest of the French settlements in the country.

Leaving New Orleans, the route continues over the ancient delta of the Mississippi, a land threaded with bayous, and through the old sugar plantation district and the Old South of legend and story, to Morgan City, noted for its lumber and fur industries and its oyster shell chick feed manufacture. The town is on Berwick Bay, the gulf outlet of the numerous waterways that constitute the Atchafalaya Basin.

From Morgan City to New Iberia, Route 90 runs along Bayou Teche, the Evangeline country immortalized by Longfellow's poem. The Acadians were exiled from Nova Scotia in 1755. Along the bayou today are Acadian towns and cities. Old live oaks, cypress and pecan trees shade the roads, homes and bayous. Between New Iberia and Crowley, the highway traverses great rice fields, flooded by water pumped through a network of canals. Just beyond Crowley is the rice experiment station. Nearby also are the Evangeline Oil field and Avery's Island where salt mines are located, and just south are the Rockefeller and Sage wild life preserves.

Route 90 continues through Lake Charles, a fine residence city, with a deep-water port, in a cotton and rice growing and cattle raising region, with important oil fields nearby, to the Texas state line, where it begins its run of 733 miles to Van Horn. It passes through Orange and Beaumont, in the Sabine district, one of the big oil producing, refining, manufacturing, distributing and exporting centers of the country. From Beaumont, a Federal-aid highway leads to the Gulf. The route continues to Houston, passing the San Jacinto Battlefield, now a beautiful park and playground, where General Sam Houston and the Texas patriots defeated Santa Anna and won Texas freedom in 1836.

Houston, 50 miles inland from the gulf coast, is an important port with a large international trade. Through the expenditure by the government and citizens of Harris county of some \$20,000,000, the Buffalo river has been converted into a ship channel, 50 miles long and with a minimum depth of 30 feet. Fifty-two steamship lines operate from Houston, a great cotton and oil center. The banks of the channel are lined with industrial plants which include several oil refineries and cotton compresses and warehouses. At the gulf entrance to the channel is Galveston, one of the finest seaports of the Gulf of Mexico with extensive steamship docks, and reached from Houston over a Federal-aid highway. It is a great cotton port. The beautiful harbor is guarded by Fort Crockett, a government military post, and three other coast defense batteries. Galveston has a sea wall boulevard of many miles, sandy beaches and amusement piers, and good fishing.

From Houston, the route continues through rich wooded and farming country, over rolling hills and valleys through Columbus, where under the oak near the courthouse the first district court of the Republic of Texas was held, to Gonzales, where the Texans mobilized and fired the first shot for independence from Mexico; then on to San Antonio, the financial and distributing center of a vast territory and the gateway to Mexico. The city is noted for its beautiful parks and drives, and sunken gardens in Breckenridge Park. In San Antonio the United States has its great military reservations with all arms of the service represented, including Fort Sam Houston, largest military post, and Kelly Field, Duncan Field and Brooks Field, important flying centers.

The history of San Antonio began in 1690 with the founding of the oldest of its five missions, Espada, whose irrigated ditches used by the padres more than 200 years ago still supply water to little nearby farms.

The Mission Conception, still in use as a church, was built in 1716, and when the city was settled in 1718, the Mission San Antonio de Valero, now the Alamo, was established. Missions were built with a twofold purpose—for the conversion of the Indians and to be used as forts for protection of Spanish interests.

The Alamo, as built by the Franciscan missionary, consisted of a church, an enclosed convent yard about 100 feet square, a convent and hospital building, and a plaza covering in all about two and one-half acres, protected by a wall eight feet high and 33 inches thick. In 1836, during the war for Texas independence, the Alamo was the scene of the remarkable conflict between some 4,000 Mexicans under Santa Anna, and a small company of Texans, including Colonel David Crockett and Colonel James Bowie who held the fort under Colonel W. B. Travis. After an almost continuous bombardment from Feb. 23 to March 6, a small break was made in the walls, and early on the morning of the 6th, the Mexicans assaulted in force. After being driven back twice with great loss, they scaled the parapet and desperate hand-to-hand battle ensued. "Remember the Alamo!" became the war cry of the Texans who finally defeated and captured Santa Anna at San Jacinto. In 1913, San Antonio began to restore the Alamo.

Westward from San Antonio, Route 90 cuts directly through the Texas hill country, through goat, sheep and cattle ranch districts with their rocky hills and spring-water streams, through Uvalde and Del Rio and a wild hill canyon and mountainous country to Van Horn, where it connects with Route 80 which then continues to San Diego, California.

WHAT TO SEE ON UNITED STATES ROUTE 90 From Jacksonville, Florida, to Van Horn, Texas.

St. Augustine—Old houses of Spanish architecture; ruins of old forts; old city gates; Fort Marion at the end of a beautiful drive along the seawall.

Jacksonville—Tropical garden; alligator and ostrich farm; Jacksonville Beach; Heckscher Drive along St. Johns river.

Tallahassee—Surrounded by beautiful Colonial mansions with vast plantations typical of the days before the war.

Ponce de Leon and DeFuniak—Noted for their sulphur springs.

Pensacola—Forts Pickens, McRae and Fort Barrancas guard entrance to the bay; Military Reservation nearby on Santa Rosa Island; two Spanish forts, San Carlos, built in 1696, and San Bernardino.

Mobile—Battle House, on Royal street, marks the site of Andrew Jackson's headquarters in 1814. The old French fort, Louis de la Mobile, was located on the site of the city hall and armory.

Biloxi—Boulder marks the spot where d'Iberville first landed to establish the first French settlement in Mississippi; "Beauvoir," the last home of Jefferson Davis, and now the Mississippi Confederate Veterans Home; Fort Massachusetts; Light House and sea wall.

New Orleans—Creole architecture; Jackson Square; the Cathedral, Presbytere; Absinthe House; Miro House; old St. Louis Hotel; Exchange and Slave Market; Beauregard Square, formerly Congo Square; home of General Beauregard; Boimare Bookshop; French and Spanish Barracks.

Morgan City to New Iberia—Route 90 runs along Bayou Teche, the Evangeline country immortalized by Longfellow's poem.

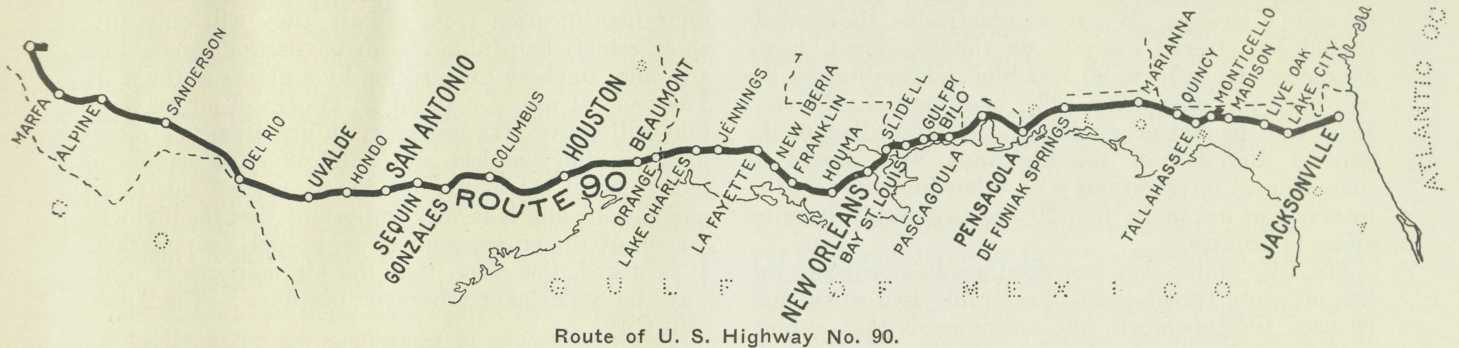
New Iberia and Crowley—Great rice fields of country; nearby are Evangeline oil field, salt mines on Avery's Island, and Rockefeller and Sage wild life preserves.

Lake Charles—Fine residence city.

Houston—Important port with large international trade; nearby is San Jacinto Battlefield, now a beautiful park and playground.

San Antonio—Historic Alamo; beautiful parks and drives; military reservations; flying fields.

Van Horn—United States Highway 90 joins 80 here.



American Company Secures Road Contract in Guatemala

JOE D. WALSTROM, Office of Commercial Attache, Guatemala.

A contract for constructing over 6 miles of road in or near Guatemala City was signed August 20, 1929, by the Secretary of Agriculture for the Guatemalan Government and by the representative of an American road construction company. The roads and a large circle at a traffic intersection are to be paved with warrenite bitulithic.

The work will be of the same quality as that on the Central Highway in Cuba. When an old roadway is to be reconstructed as a base course for the new pavement, the surface of the old roadway must be scarified to a uniform depth of 1.87 inches so as to permit satisfactory reshaping and the binding of the
(Turn to page 21.)



Project 615. Bridge on that Portion of Road No. 5 Between Venice and Myakka River.

Marking of Highways to Guide Aircraft Is Now Proposed

THE Aeronautics branch of the Department of Commerce, in connection with its aids to air navigation, has just completed its suggested specifications for the air marking of highways.

Such identification of highways will constitute a real boon to aviators, in the opinion of Harry H. Blee, chief of the airports and aeronautic information division of the Department of Commerce.

The department recommends for this purpose quite simple markings involving in each instance the official route number preceded by the letters "U. S." in the case of Federal highways, or by the state abbreviation for state highways. Wherever practicable, the symbols should be lettered directly on the pavement, using characters from 10 to 30 feet high, depending on the width of the pavement. The markings should read from west to east or south to north, according to the general direction of the highways, and should be placed at all intersections with other highways and at intervals of not more than 20 and preferably 10 miles along the routes.

Mr. Blee states that any good grade of chrome yellow or white traffic paint, preferably two coats, may be used for this work, but recommends that chrome

yellow be used wherever possible. In the case of light colored pavements the chrome characters may be outlined in black. All these specifications will be included in a bulletin on the subject of air marking soon to be ready for distribution.

Mr. Blee recently made the following comment on the need for air marking of highways:

"A highway, when viewed from the air, stands out very clearly and is, therefore, one of the pilot's best landmarks if he knows what highway it is. As soon as surface arteries of motor travel, particularly the Federal and state roads, are properly marked, to facilitate their identification from the air, they will constitute an extremely helpful aid to air navigation by enabling any pilot to check his position by a glance at the map. The general use of a standard system of air marking that will convey the necessary information to aircraft pilots in the simplest and most effective manner is today one of the most immediately needed aids to air navigation; and it is very important that the highway system of the entire country be properly air marked. It is urged, therefore, that the air marking of highways be undertaken wherever possible."—The American City.

Knows His Chuck

A lady was entertaining the small son of her married friend.

"Are you quite sure you can cut your meat, Willy?" she asked after watching him a moment.

"Oh, yessum," he replied without looking up. "We often have it as tough as this at home."—The Lyre.

Putting His Foot Down

Curiosity—"Did you give your wife that little lecture on economy you talked about?"

Domesticity—"Yes."

Curiosity—"Any results?"

Domesticity—"I've got to give up smoking."—Tit-Bits.



Project 664, Doctor's Lake Bridge, Road 3.

Why Not Make Motor Travel as Stimulating to the Eye as It Is to the Speedometer?

ROAD building, in recent years, has assumed the proportions of a major industry . . . but it cannot yet claim, in any broad sense, to be numbered among the fine arts. We are still in the grip of the past and think of highways as purely utilitarian devices whose sole function is to enable us to get from place to place in the shortest possible time.

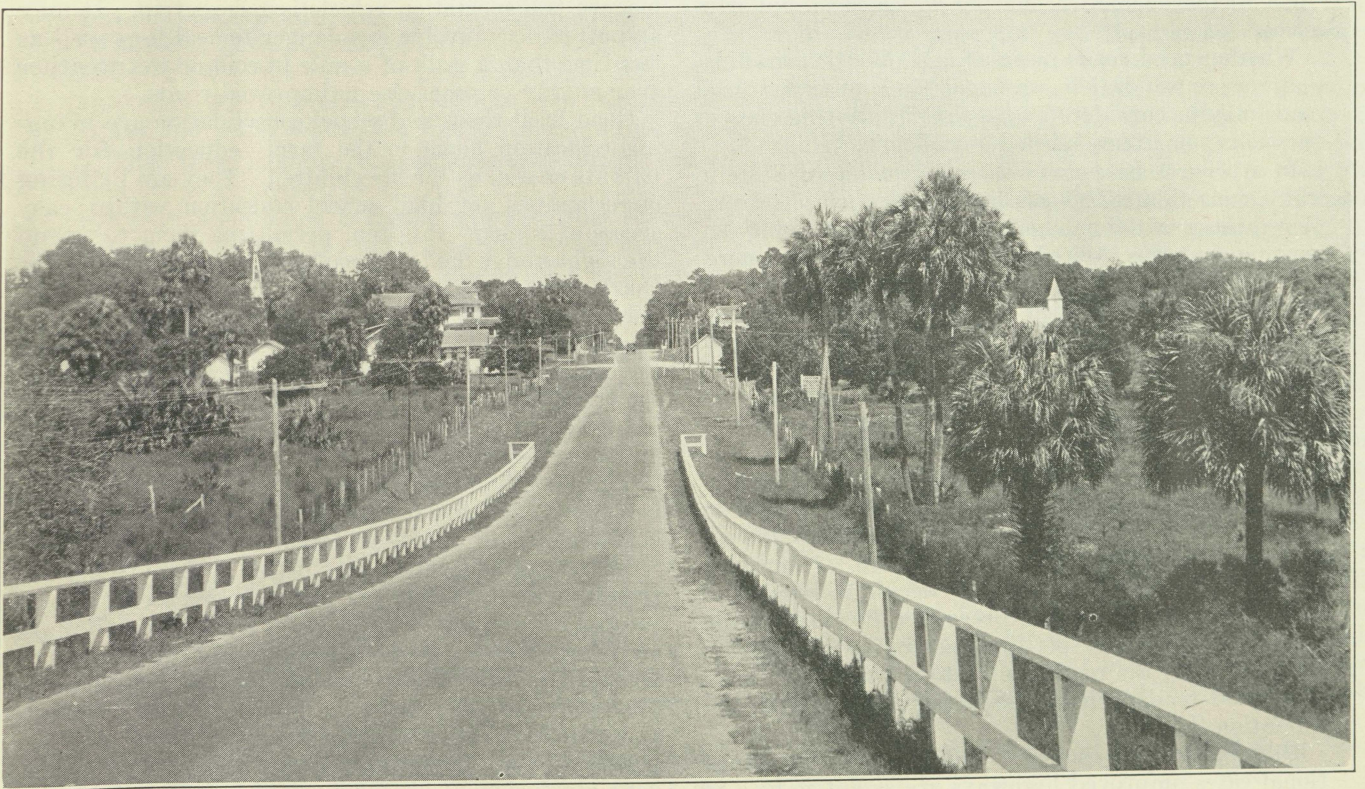
We sally forth in quest of charm, restfulness and beauty, and presently find ourselves upon a hard, smooth ribbon of concrete or cement, straight as the ruler which laid it out. Ahead, we see nothing but the slowly converging, straight lines of the roadsides, which are finally lost at a hazy vanishing point. If we look a little to right or left, billboards come within the field of vision. We lose all sense of being in the open, for our setting has made us a part of a diagram illustrative of simple perspective. We have, to be sure, the road surface we paid for, but we have been cheated out of all the charm and beauty we might have had along with it, had there been proper tree planting and an easily arranged succession of pleasant prospects.

America is raising the level of her civilization by leaps and starts. She is discovering, as at no time in the past, the value of beauty, not only as a commercial asset but as a sweetener of life and as a luxury without which life is never what it might be. In a score of ways civic beauty is becoming an issue, and each community must decide for itself whether it wants it, whether it deserves it, whether it is willing to pay a

little extra to get it. Cities and towns which have fostered it know how many times over it pays for itself in heightened self-respect, in local pride, in attractiveness to strangers and in rising property values. . . .

It would be hard to find any valid reason why we should not think about beauty when laying out our highways, why we should not in this way strive to make motor travel as stimulating to the eye as it is to the speedometer. Long before we wear out the roads we are now constructing, the demand for outdoor beauty will be far more general and insistent than it is today; and if these hoads are stark and ugly, they will not be so leniently judged ten years hence as they are at present, when we are only beginning to perceive their drab, unimaginative monotony.

We believe that it would be well worth while to make a frank and open cash concession to beauty. Let our highway engineers have the assistance of qualified landscape architects who shall be permitted to modify ugly straight-line gashes through hill and valley within prescribed limits of additional mileage and additional cost of construction and right-of-way. Dollar for dollar, we should get more for our money put into this overplus than for that expended upon the straightest and ugliest highway conceivable. Legislators and State and county officials will presently wake up to this rather obvious fact and will usher us into a new and happier era of highway construction—From a recent editorial in the *Saturday Evening Post*, reprinted by permission.



Road 2, South of McIntosh.

How Improved Highways Are Promoting Rural Education

By **KATHERINE M. COOK**

Chief, Division of Rural Education, U. S. Bureau of Education, Washington, D. C.

BIGGER and better rural school houses replacing the little old red school houses of traditional reverence are of growing importance as measures of educational progress in modern rural communities. More and more miles of better and better highways have preceded, accompanied and followed the building of such school houses in thousands of rural communities during the past decade.

Past Decade a Consolidation Era

Ohio offers one example. In the past 10 years, 4,000 consolidated schools have been built there, an average of one a day, replacing thousands of schools of the one and two-teacher variety. In 1927, Ohio led the States in local disbursements and was among the first 14 in State disbursements for improved roadways. There are in round numbers 44,000 miles of surfaced roads within her borders.

A number of other States which are outstanding in respect to recent school consolidation are equally outstanding in road building, with programs apparently paralleling each other in time as well as territory involved. North Carolina is another excellent example. Hence, if experience is any criterion for judgment it may be assumed that the two programs (improved roads and improved schools) are closely related.

Last year there was spent \$40,000,000 for transporting children to school—probably most of them over improved highways. Nearly 15,000 motor buses served 14,695 schools. For approximately four to five million children enrolled in the elementary and secondary grades of our consolidated schools, now totaling 17,000, this expenditure represents an investment in ultimate values difficult to estimate educationally and is a "noble experiment" in offering wider social opportunities.

Whether good roads promote and precede consolidation, or consolidation promotes and precedes good roads may be considered as in that interesting class of questions sometimes labeled "academic."

In a progressive county in a Southwestern State in which consolidated schools had all but completely replaced those of the one-teacher variety, the county superintendent was invited by the chamber of commerce in the county seat to speak at the weekly luncheon of that body on "How Good Roads Have Helped Secure Consolidated Schools in ——— County." The superintendent replied that she would gladly accept the invitation to speak if the topic were changed to read, "How Consolidated Schools Have Helped Secure Good Roads in ——— County."

Another county superintendent, addressing an educational meeting recently, was asked if the consolidation of schools, which had reached practically 100 per cent in that county, came as the result of improved roads. Her reply was, "No; we decide to consolidate the schools, select the site, proceed with our building, and in the meantime petition the county commissioners to improve the road leading to the schools. In our case, good roads follow as well as precede school consolidation."

Barring for the moment the more or less exceptional cases, improved highways are as apt to be a re-

sult of school consolidation as is consolidation to be the result of improved highways. Much of the same spirit necessary to promote the one, promotes also the other.

That improved educational facilities for thousands of farm children, through centralization, wait on improved road conditions is a fact not to be overlooked. Isolated homes and communities where the poor quality of the soil, difficult topography, lack of funds for drainage and other fundamental road improvements combine to eliminate the possibility of long distance travel, are still with us in large numbers and particularly prevalent in some of our States.

Consolidation Not Only Benefit

But the significance of improved roads to the education of children in these situations is not confined to the extension of the consolidation movement. Difficulty of walking to and from school, increased by necessity of the children to struggle over muddy, undrained roads, often in deep snow, or through inclement weather, has been found in several studies of the question to be the most significant cause of irregular school attendance of country children.

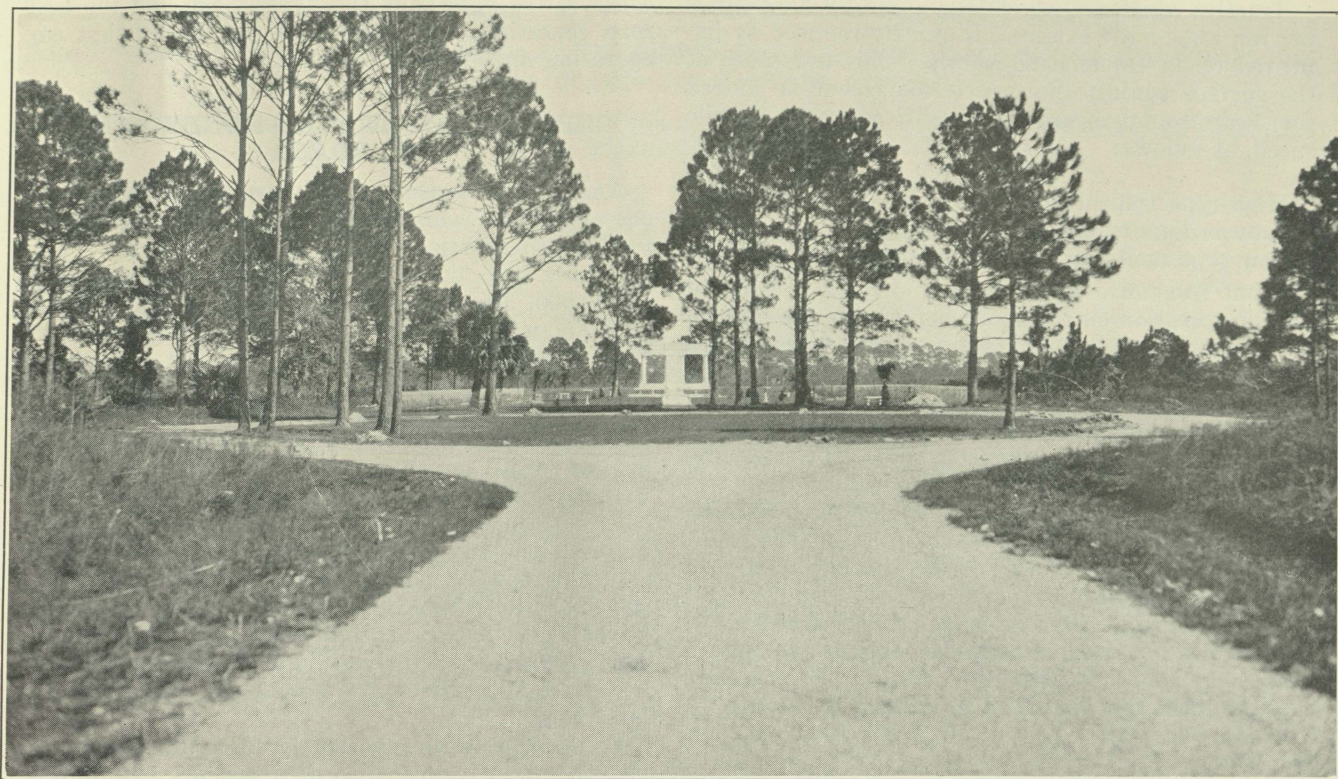
Even if children must walk to the school—be the school large or small—good roads increase educational opportunities to a considerable degree.

Co-operation in school and road programs of improvement is, of course, the satisfactory plan. Schools can and should be located not only centrally in relation to the children served, but centrally in relation to the system of improved highways. Accessibility is far from being in 1929 the question it was in 1910, or even in 1920. Ten miles to school over a good road in a modern transportation vehicle is a short trip. It may and often does involve less danger to health as well as less time than a walk of a mile in cold or wet weather over muddy or otherwise unimproved roads.

Good local roads and school consolidation are bringing education home to the farm—education for the parents as well as for the children. They are bringing opportunities for high school education within easy access of country children, permitting them to spend the night under the home roof and in the family circle. Good roads combined with the innate faith of every American parent in the efficiency of education as a means of making for his children a better world than the one he himself has lived in, are changing the social order in farm communities.

In the better organized and more progressive communities, school centralization is proceeding on a larger scale than ever before. Whole counties are now being surveyed and schools located with a view to the best interests of all the children in the county.

Larger enrollments mean better trained teachers, richer curriculum offerings, and enlarged social opportunities. Good side or local roads are helping to make all this possible. That the generation represented by the youth now in school—reared with an appreciation of the relationship between highway improvements and education in its broadest sense—will continue the program on an increasingly larger scale, seems a foregone conclusion.



Site of Florida's First Capitol, St. Joseph, Fla. Near Road 10.

In another article in *The United States Daily*, Timon Covert, assistant specialist in rural education, U. S. Bureau of Education, presents these significant facts bearing on both sides of this subject:

Since 1918 more than 35,000 small, inefficient rural schools have been closed, approximately 10,000 consolidated schools established, and an average of about \$24,000,000 expended annually in transporting pupils to school. These figures indicate how it has been possible, in part, as a result of improved roads, for three important movements in education to help bring about fewer and better schools for country boys and girls.

That these modern rural schools are proving satisfactory is evidenced by the fact that the movement toward consolidation is rather constant; that they are better schools than the small ones supplanted is rather conclusively shown by many studies of instructional results in the two types of schools.

On the other hand, the following situation, typical of many, exists in a Midwestern State. Three one-teacher schools, one enrolling fewer than 10 pupils, all within a radius of four miles, are practically isolated from one another because connecting roads are impassable much of the time. The absence of one bridge over a small creek which runs through the territory, effectively obstructs all transportation across the stream. There is an abundance of gravel, excellent for road surfacing, in two of the four school districts, but little use has ever been made of it.

Commerce, social activities, and educational facilities alike are retarded a quarter of a century in this community because roads have not been improved. Each district is obliged to maintain a school, under present conditions, although all of the elementary pupils of the three one-room schools could easily be

transported over good roads in one large motor bus to the larger school.

In another State there is this situation: Four small villages are located at intervals of five miles along a well-kept highway. Each village maintains an elementary school, and in addition each village with its adjacent territory, attempts to maintain a four-year high school. The combined enrollment of these four high schools is less than 200 and the number of teachers employed in them is 15.

Within a radius of a few miles of each village are many one-teacher schools. Many of these have small enrollments. The topography of the entire territory is favorable for good roads and gravel is plentiful, but little side road surfacing has been done. Seasonal changes render many roads unfit for regular use.

Good Roads Pay

FURTHER proof that good roads are a paying investment from the highway user's point of view is shown in an analysis of automobile operation costs on various types of highways now being studied by the highway finance committee of the American Road Builders' Association.

The average automobile owner may prefer not to know what his per mile operating cost actually amounts to, but he is surely interested in knowing how much he saves by driving on improved roads, also the difference in cost of operating various types of cars and the savings accruing in each case as the result of highway improvement.

Data used by the committee is obtained from many sources, much of it furnished by Agg and Carter.

Tractive resistance, which amounts to 2,000 pounds per ton when a car is mired, is quickly reduced by improved roads, the analysis shows. This resistance of the surface against the vehicle movement is figured for year-around operation at an average 35-mile speed, as follows:

	Lbs. Per Ton
High type (paved surfaces)	70
Intermediate type (treated surfaces)	110
Low type (soil and gravel surfaces)	160

Wind resistance may increase slightly the actual cost of operation on the good surfaces, as the natural tendency of traffic is to maintain a higher speed there, effecting a saving of time but adding to the wind resistance.

The average relative gasoline consumption, determined from reported engine tests and actual measurements on the road, showed that where a vehicle will travel 15 miles to the gallon on a high type surface, it will require 1.2 gallons of gasoline on the intermediate type and 1.47 gallons on the low type road surface for the same distance.

From detailed cost records reported on about 800 automobiles operated in various parts of the United States, figures were prepared taking all factors into consideration, showing the average cost of automobile operation over all types of surfacing to be in cents per mile:

Light fours, 6.02; Medium fours, 6.42; Heavy fours, 7.20; Light sixes, 7.38; Medium sixes, 8.40; Heavy sixes, 9.45.

Among the various items of operating costs, road condition is shown to have no effect on license, garage, interest and insurance. The increase in cost of maintenance and in depreciation of automobiles as the type of road becomes poorer is in somewhat the same ratio as the increase in gasoline consumption, shown above. In cost of tires and tubes comes the greatest increase, and it is estimated that where \$1 is expended for this item on high type roads, the cost is more than double on intermediate type roads, or \$2.22, and almost triple on low type roads, or \$2.90.

The division of cost items on an imaginary "average" automobile, based on annual mileage of 11,000, is shown as follows:

Items of cost	Cents per mile
Gasoline	1.31
Oil	0.22
Tires and tubes	0.64
Maintenance	1.72
Depreciation	1.39
License	0.24
Garage at \$4 per month	0.44
Interest at 6%	0.36
Insurance (fire, theft, tornado)	0.21

Total cents per mile 6.43

The saving shown in operation of such average automobile due to road improvement is, where low type roads are changed to intermediate type, 1.07 cents per mile, where intermediate type is changed to high type, 0.99 cents per mile, and where low type is changed to high type, 2.06 cents per mile.

The cost tables range from eleven cents per mile, the cost of operation of a "heavy six" over low type roads, down to 5.10 cents, the cost of operating a "light four" over high type roads. This gives a

conservative figure for the lightest car and the best road conditions obtainable, and for the heaviest car operating on low type roads.

ONE-SIXTH OF TRAVEL MONEY GOES TO ROADS

American motorists annually are paying only about one and a half cents per mile of travel for street and road improvements.

During 1928, the motor car registration was roughly 24,000,000. These Cars averaged in the neighborhood of 5,000 miles of travel. A conservative estimate of operating expenses places the 1928 automobile travel costs, which include gasoline, oil, depreciation, taxes, upkeep and so on, at 12 billion dollars.

Of this sum only two billions, or one-sixth, was expended for all road and street improvements.

Industrial economists and highway authorities point out that with both pleasure and commercial traffic increasing by leaps and bounds, the annual highway expenditure must be increased. Conservative figures show that the United States, with 78 per cent of the world's automobiles, spends altogether for new cars, repairs, fuel, truck drivers' and chauffeurs' salaries, insurance and other items, no less than 14 billion dollars yearly.

Consider with this overwhelming figure, the investment to date in dealers' establishments and storage and servicing garages, gasoline filling stations, and the money invested in cars purchased prior to 1928, all of a total of about 25 billions.

Manufacturing motor cars has for some years been the nation's chief industry. In 1928 more than 4,000,000 people were engaged in one way or another in producing materials and in manufacturing 4,600,000 passenger cars, trucks and busses, worth in excess of three and one-half billion dollars.

And this tremendous motor industry, which is responsible in large measure for current prosperity, is dependent upon the highway. Investing in highway improvements is not only investing in comfort, convenience and economy for the car user, but it is also an insurance against the return of those poverty stricken days when shirts with 20 removable bosoms were a godsend.—Michigan Roads and Airports.

When We're Careless

The pastor was examining one of the younger classes, and asked the question, "What are the sins of omission?" After a little silence one young lady offered:

"Please, sir, they're sins we ought to have committed and haven't."—Pullman News.

In Feather-Bed Lane.

Fred—"Your car is six months old and yet hasn't a scratch on it. How do you manage to preserve its finish, old man?"

Ted—"Quite simple. I make it a rule always to park between new cars."—Automotive News.

The September issue of Florida Highways printed a list of 164 roads in all parts of the State, built during the last few years, putting our State up with the top-pers in total mileage of high-class roads.—Moses Folsom, "Flashes of Florida Facts," in Times-Union.

"See the Americas First", New Motorists' Slogan

Senator Oddie, of Nevada, U. S. Delegate to Rio Road Congress, Cites Recommendations That Would Provide Highway Construction For Latin America

Inter-American Automobile Road Will Promote Flow of Tourist Travel and Throw Open Scenic Splendors of the Western Hemisphere

"SEE THE AMERICAS FIRST" will soon become the revised slogan of the motorist of the Western Hemisphere, in the opinion of Senator Tasker L. Oddie, of Nevada, member of the United States delegation to the Second Pan-American Congress of Highways at Rio de Janeiro last August, who reported on the congress to the United States Senate recently. Senator Oddie, a member of the committee on post offices and post roads of the upper house, was the representative of that body appointed by President Hoover to attend the congress.

As the resolutions and recommendations adopted by the congress are followed out and incorporated in national highway programs of Latin American countries, the senator said, facilities for motor travel will increase to the point where the scenic splendors and the natural resources of all countries of the Americas will be accessible to the international motorist.

"Latin American countries are today where the United States stood in the point of road construction prior to the Federal Aid Road Act of 1916," Senator Oddie said. "There is one important difference, however, and that is that the social and economic influences exerted by motor transportation are much more clearly understood and the period of trial and error through which the United States has had to pass has been largely eliminated because of the great work of the engineers of the federal and state governments.

"Everywhere there is an urgent demand for more and better roads, but thus far there has been little legislation in Latin American countries which would consolidate the road programs," the senator said. "The remarkable results which have been obtained in the United States through enactment of our federal aid road act are clearly understood and appreciated by leaders in Latin American countries, and there is more than passing evidence that it will not be long before national governments of these countries accept in greater degree their responsibilities in this endeavor. When that time comes it may be expected that just as federal legislation welded together our several state highway systems, gave impetus to heightened standards and stimulated highway progress along efficient and economical lines, so will similar results be noted in these countries.

Realizing that co-ordination of effort is not only desirable, but necessary to an adequate system of national and international highways, the congress recommended co-operation between the central governments and provincial or municipal authorities, assisting in the building as well as the financing of roads, Senator Oddie said: Thus an intelligent, economic and serviceable system will be created which, with proper connections at national frontiers will serve to provide excellent means of international intercourse.

In its advocacy of good roads, the congress did not overlook the fact that the first essential is roads, no matter of what type they are. Therefore, the senator said, it strongly recommended that the governments participating first of all build low-cost roads, letting improvement go until the increase in traffic demands a

higher type surface. This recommendation is expected to result in opening up many hitherto more or less inaccessible regions in Latin America, and, as traffic on these highways increases and brings a greater income from motor and gasoline taxes, which in turn may be used for road construction, these roads will be improved to the point where they will be first-class motor highways.

"Modern methods of road construction are in use throughout most countries in South America," Senator Oddie asserted, "and on most work that is being done machinery is of the most up-to-date type. At the congress itself there was complete agreement between the different technical delegates as to what constituted the best methods, and the conclusions adopted may be considered as the last word on the subject."

The progressive system of construction was recommended by the congress in 1925 as well as the one just closed. Under this system, after the location has been decided upon, the road is graded and drained and bridges and culverts put in. When this original road-bed no longer withstands the increasing traffic, a new and more resisting surface is applied.

Accompanying Senator Oddie's report was a set of conclusions adopted by the congress at Rio. In addition to the questions of federal aid in highway construction and progressive road improvement, the congress recommended that each country incorporate a set of basic principles of traffic control in its national motor vehicle laws. These basic principles are to be provided by a treaty to be sponsored by the Pan-American Union, and upon its ratification a great step toward uniformity of international traffic control will have been taken. The question of such a treaty came up, the senator pointed out, when the congress was on the subject of the Inter-American highway.

"This phase of the conference," Senator Oddie said, "was one of the most interesting. It was evident from the start that leaders in all countries are looking forward to the day when, through the gradual building of national highway systems, it will be possible to link all mainland countries of North, Central and South America with roads over which the man from Canada may visit the resident of Tierra del Fuego without taking to the sea.

"While it was recognized by all that this constitutes a long-time program, there was a general feeling that certain sections of the road, such as those from Texas to Panama, from Brazil to Bolivia, from Chile to Argentina or Peru, would be found well under way, if not actually completed and in use, before many years have passed."

Perhaps the most outstanding reaction obtained by members of the United States delegation to the congress, Senator Oddie continued, was a sense of the great progress which has been made in crystallizing national highway programs in the years that have intervened since 1925, the year of the first Pan-American Congress of Highways.

Throughout Brazil, the senator pointed out, there is an awakening demand for more and better roads, and

everywhere local and state governments are vying with one another to open the doors to their domains. That this spirit obtains in other countries of South America, he asserted, was the unanimous evidence presented by delegates to the congress, and it is no longer a question of whether roads shall be built but one of how they can be built more expeditiously and what methods are to be followed in construction.

Much time and thought, Senator Oddie continued, is being devoted by the leaders in South American countries to a continuing effort to acquaint the people of their respective nations with their own necessities as to more adequate systems of highway transportation and this was one of the subjects to which the delegates gave much attention. They strongly endorsed the work of the Pan-American Confederation for Highway Education and the fine results it has accomplished in its educational and constructive campaign, he asserted.

High praise is due to individual members of the United States delegation, Senator Oddie said, and he attributed much of the success of the congress to their untiring zeal, diplomatic skill, and knowledge of men

and conditions in Latin America. The delegation, in addition to Senator Oddie, who returned to the United States when the congress closed, is composed of J. Walter Drake, former assistant secretary of commerce, chairman; Representative Cyrenus Cole, of Iowa; Thomas H. MacDonald, chief of the United States Bureau of Public Roads; Frank T. Sheets, chief highway engineer for Illinois; Frederic A. Reimer, president American Road Builders' Association; H. H. Rice, treasurer, the National Automobile Chamber of Commerce, and Pyke Johnson, who accompanied the delegation as executive secretary. The delegation was also accompanied by Dr. William Manger, of the Pan-American Union.

Following the congress the United States delegation proceeded to Uruguay, Argentina, Chile, Bolivia and Peru, where conferences regarding financial, economic and construction phases of highway systems were held with government officials. From Peru the delegation went to Panama for the Central American Road Conference, beginning October 7 and ending October 11. The delegation returns to the United States November 1.

The Traffic Survey and Its Uses

By L. E. PEABODY, Highway Economist,

U. S. Bureau of Public Roads, in the United States Daily

THE highway traffic surveys made by the Bureau of Public Roads, in co-operation with State and local highway authorities, are much more than mere counts of vehicles on the highways. They give to highway officials desirous of conducting their operations in a business-like manner the one sure means of dealing justly with the many demands made on them for highway improvements.

They afford the basis of a rational budget and program of road improvement. They show the real highway needs of the present traffic and they provide the necessary basis for estimation of future needs.

Such surveys have been made by the bureau in the States of Maine, New Hampshire, Vermont, Connecticut, Pennsylvania and Ohio, and for the purpose of solving pressing metropolitan problems in the counties adjacent to Chicago and Cleveland. During the present year simultaneous surveys will be made with the bureau's help on all the Federal Aid roads of the States of Washington, Oregon, California, Idaho, Montana, Utah, Nevada, Arizona, Wyoming, Colorado, New Mexico and Nebraska.

Thus, with the direct assistance of the bureau a number of states have provided themselves with the factual information which is essential to the business-like conduct of the work of road improvement, and others are about to profit in a similar manner. Others with which there have been no direct co-operation have followed the methods developed by the bureau in making surveys under their own auspices; and the same methods are used by consulting experts employed by a number of cities to work out their traffic problems.

Simple counts of the vehicles using the highways on one or two days of each year have been made for a number of years by several of the State highway departments. Such counts are now found to be of limited usefulness and, when the counts are made at the

wrong season of the year, as they often are, the information they supply may be actually misleading.

From this simple and inadequate form the methods of traffic analysis have been developed under the bureau's leadership, so that there is now provided for the guidance of administrative officials a complete and understandable picture of the existing highway situation and a clear indication of the future needs.

Contributing to the composite picture, in addition to data showing the average daily use of each section of the highway system, are detailed data that show the composition of the traffic, the number of passenger cars, trucks and other classes of vehicles, the origins and the destinations of these vehicles, whether they are owned by farmers or city dwellers, the regularity and frequency of the trips they make and a variety of other data.

The uses of such traffic data are as varied as the information itself. The constant urge of public opinion for more and better highways compels a selection of routes for first improvement, because obviously the amount of work possible at any time is limited by the construction equipment and money available.

The traffic survey provides a sure means of classifying highways in the order of their importance. The type and design of surface, the width necessary, and sometimes the grades and curvature are directly related to the traffic data, which indicate the specific requirements to be met in design and construction.

The information regarding origin and designation enables one to place correct values on local and long-distance traffic as affecting the general layout of the highways and the construction program. This information also indicates the need of new roads or of alternate roads to carry traffic between definite points.

In city areas proper control and regulation require traffic information to locate congestion points or con-

(Turn to page 20.)



Road No. 19, Levy County. Scene in Williston.

Contracts Awarded by State Road Department January 1st, 1929, to October 16th, 1929

Proj.	Road	County	Contractor	Length Miles	Length Feet	Contract + 10%	Type
55	14	Alachua	L. M. Gray	16.77		206,412.32	R. B. S. T.
624	50	Hamilton	Manly Const. Co.	6.23		84,888.18	R. B. S. T.
858	4	Duval	F. S. Whitney	7.00		68,438.10	Mac. Asph.
678	10	Bay	McVay Lindsay & Son	5.00		9,295.00	Hauling
695	2	Lake	Manly Const. Co.	0.40		5,380.54	R. B. S. T.
6	1	Madison	Duval Engr. & Contr. Co.	5.45		91,560.17	R. B. S. T.
669-Y	27	Collier	Kerr and Lawrence	13.55		99,705.56	Grading
854	60	Walton	G. W. Byrd	9.81		85,160.28	Sand Clay
855	60	Walton	C. C. Moore Const. Co.	9.32		90,311.26	Sand Clay
661	2	Lake	Manly Const. Co.	.14		9,313.15	Sheet Asp.
767-688	10	Bay	H. W. Johnson		75	2,567.88	Timber
40-B	4	Brevard	I. B. Purdy			10,565.72	Embankment
806-A	25	Hendry	R. C. Huffman Const. Co.	11.00		32,594.05	C. G. & G.
806-C	25	Hendry	R. B. Stuart	11.00		44,761.37	C. G. & G.
806-D	25	Hendry	R. C. Huffman Const. Co.	12.76		62,950.91	C. G. & G.
62-B	24	Osceola	Florida Bridge & Const. Co.		789	115,447.66	Conc. Bdg.
518	5-A	Lafayette	Broadbent Const. Co.	17.57		244,783.73	R. B. S. T.
587-B	5-A	Columbia	Perkins & Lawson		99	11,405.71	Conc. Bdg.
678	10	Bay	McVay Lindsay & Son	4.00		13,860.00	Hauling
715	28	Union	L. M. Gray	5.26		70,922.96	R. B. S. T.
716	28	Bradford	Duval Engr. & Contr. Co.	11.22		157,799.23	R. B. S. T.
587	5-A	Columbia	Duval Engr. & Contr. Co.	4.43		53,885.30	R. B. S. T.
718	5-A	Columbia	Duval Engr. & Contr. Co.	8.22		101,724.95	R. B. S. T.
815	54	Okaloosa	G. W. Byrd	12.50		27,434.00	Sand Clay
717-706-A	28	Bradford-Clay	Manly Const. Co.	12.06		173,340.83	R. B. S. T.
749-750	14	Gilchrist	L. B. McLeod Const. Co.	8.52		100,722.27	R. B. S. T.
820	96	Jefferson	H. D. Spangler & Co.	9.38		63,008.18	G. & D.
821	96	Jefferson	H. D. Spangler & Co.	5.13		25,478.80	G. & D.
615	5	Sarasota	L. B. McLeod Const. Co.	1.20		20,359.90	R. B. S. T.
	25	Palm Beach	Southern Asph. Const. Co.	4.00		5,575.87	S. T.
64-A	17	Hillsborough	H. E. Wolfe Const. Co.	9.609		257,589.40	Concrete
64-C	17	Hillsborough	H. E. Wolfe Const. Co.	9.61		239,707.82	Concrete
728	10	Leon	Robert G. Lassiter & Co.	11.76		245,718.22	Concrete
65	5	Hillsborough	Fred D. Beasley		423.34	103,856.44	Concrete
742	13	Alachua	L. B. McLeod Const. Co.	7.65		85,343.11	R. B. S. T.
669-Y	27	Collier	Wm. P. McDonald Const. Co.	3.00		48,974.75	R. B. S. T.
695	2	Lake	Manly Const. Co.	6.03		89,689.93	R. B. S. T.
863	56	Columbia	L. M. Gray	1.476		30,078.51	R. B. S. T.
866	17	Hillsborough	Cone Bros. Const. Co.	.50		19,075.00	Asp. Block.
644-C	10	Wakulla	L. B. McLeod Const. Co.	5.05		89,542.16	R. B. S. T.
68-A1	4	Palm Beach	Powell Brothers		199.19	62,038.95	Concrete
68-A1	4	Palm Beach	Nashville Bridge Co.		40.0	27,199.70	Bascul
68-A2	4	Broward	Foley & Milane		46.5	27,703.83	Concrete
68-A3	4	Broward	Foley & Milane		46.5	24,259.40	Concrete
63-B1	4	Palm Beach-Broward	W. S. Lockman Const. Co.		191.12	57,531.88	Concrete
63-B1	4	Palm Beach-Broward	Nashville Bridge Co.		60.0	31,537.00	Bascul
63-B2	4	Broward	Murphy Const. Co.		203.81	50,706.64	Concrete
63-B3	4	Broward	Murphy Const. Co.		134.31	38,027.33	Concrete
721-B	3	Putnam	Austin Bros. Bridge Co.		368.58	120,321.41	Conc. & Steel
835	5	Marion-Citrus	Sahlman & Hogan Const. Co.		264.56	26,850.34	Concrete
Total				266.6	2,840.91	\$3,765,405.70	

THE TRAFFIC SURVEY AND ITS USES

(Continued from page 18.)

gested routes as a basis for establishing traffic lights and controls and to determine the specific needs for new streets and structures. Many surveys have demonstrated that present facilities are ample if traffic is properly redistributed and controlled.

Studies of parking practices and resulting reforms in such practices have been of prime importance in city work. The separation of traffic, by routing passenger cars and light vehicles on one street or level and heavier on another, has been helpful in raising the traffic efficiency of existing facilities.

In addition to these uses of the census data for purpose of broad planning, there are a number of special problems, in dealing with which an exact knowledge of the traffic density and other characteristics is of primary value. Some of these other uses are suggested simply by stating a few of the more common highway problems:

1. The establishment of a maintenance program and expenditures thereunder.
2. Whether to pave or oil a road on which the existing surface is of low type.
3. Decision as to whether a gravel surface has reached the limit of economic use.
4. The determination of the economy of snow removal.
5. The necessity of special design of highways near large cities to accommodate truck traffic of high density and great weight.
6. The determination of the amounts of foreign and tourist traffic, a factor in determining road service and fixing of gasoline tax rates.
7. The determination of pavement widths.
8. Problems of traffic regulation and highway safety.

The above list is not exhaustive, but it is clear that the proper solution of each of the problems mentioned is dependent upon a precise knowledge of the traffic to be served; and it is also apparent that a variety of facts concerning the traffic are required for the solution of the various problems.

For some the data required are those which will furnish an accurate idea of the flow of traffic throughout the year; others require a knowledge of winter traffic, others of peak density, others of some fraction of the total traffic, such as motor trucks, foreign vehicles, etc.

In planning a traffic survey it is essential that there shall be a clear understanding of the methods to be employed in converting the basic data to the solution of the various problems. Otherwise essential data may not be obtained and much gathered that is later found to be useless. The method employed must be carefully designed to supply a maximum of information, precisely the kind required, at a minimum of expense.—

1928 MILEAGE OF ROADS COMPLETED ON STATE SYSTEM

State	With Federal Aid	Without Federal Aid	Total
Alabama	346	590	936
Arizona	113	41	154
Arkansas	.....	.....	1,000
California	107	542	649
Colorado	145	200	345
Connecticut	136	44	180
Delaware	20	45	65
Florida	53	464	517
Georgia	151	578	729
Idaho	.....	.....	701
Illinois	314	761	1,075
Indiana	.....	.....	330
Iowa	.....	.....	1,267
Kansas	441	858	1,299
Kentucky	394	627	1,021
Louisiana	.....	.....	288
Maine	58	40	98
Maryland	21	124	145
Massachusetts	89	49	138
Michigan	248	292	541
Minnesota	93	651	744
Mississippi	244	.....	244
Missouri	231	246	477
Montana	268	.....	268
Nebraska	213	465	678
Nevada	364	.....	364
New Hampshire	40	48	88
New Jersey	57	96	153
New Mexico	114	300	414
New York	.....	.....	361
North Carolina	172	906	1,078
North Dakota	824	13	837
Ohio	314	254	568
Oklahoma	.....	.....	467
Oregon	52	209	261
Pennsylvania	250	395	645
Rhode Island	31	7	38
South Carolina	234	396	630
South Dakota	283	67	350
Tennessee	.....	.....	516
Texas	.....	.....	2,356
Utah	113	55	168
Vermont	60	115	175
Virginia	71	500	571
Washington	105	181	286
West Virginia	74	298	372
Wisconsin	301	338	639
Wyoming	266	115	381
Total	7,410	10,910	25,607

ELIMINATION OF RAILROAD CROSSINGS, 1928, STATE SYSTEM

State	Relocation	Overhead or Underpass	Total
Alabama	25	30	55
Arizona	5	3	8
Arkansas	81	5	86
California	2	8	10
Colorado	4	5	9
Connecticut	1	2	3
Delaware	0	0	0
Florida	.....	8	8
Georgia	34	7	41
Idaho	3	2	5
Illinois	18	11	29
Indiana	23	1	24
Iowa	14	3	17
Kansas	31	3	34
Kentucky	17	5	22
Louisiana	1	.....	1
Maine	4	1	5
Maryland	2	1	3
Massachusetts	2	.....	2
Michigan	22	7	29
Minnesota	17	10	27
Mississippi	14	6	20
Missouri	60	23	83

(Turn to page 23.)

GOOD ROADS AND AUTOMOBILES

(Continued from page 4.)

finest "knockers" for a section that could be found. They never forget the mud or the rocks or the sand encountered, and delay at a ferry or doubts regarding a bridge, make a lasting impression upon the traveler. If things are not to his liking, the automobilist will not come that way again, intentionally.

But the Index was not taking much space to talk about bad roads. The fine highways already built in the South and those under construction, and more contemplated or planned, are given a great deal more attention. An article on the front page of the publication tells of the expectation of eight Southeastern States to spend a hundred million dollars in 1930 for road construction and maintenance. The Southwestern States are also indicated as having a big program in the making. "Road construction has grown into a gigantic industry in the South," says the Index. "It becomes more and more standardized, with constant improvement in administration, in engineering practice, in methods of construction and maintenance. Each year it becomes more highly organized."

This is highly satisfactory to the economist, and every good citizen can appreciate the importance of getting the most satisfactory results from the expenditure of so much money. It is a matter of pride, assuredly, for America to be recognized as the birthplace of the automobile and the country using 78 per cent of the motor cars of the world. And this would never have worked out if there had not been found a way to build good roads. The motor car is useful to the extent that it can travel where the owner desires to go. With millions of cars rolling around there would suddenly be a slackening of demand if the movement of the riders was restricted. In fact, the business of making automobiles would slump terribly if there was the slightest indication of a check on the construction or improvement of highways.

"Our knowledge of road building and road maintenance has vastly improved in the last decade or two," says the Index. "Official America and engineering America literally have gone to school on the subject of road construction. Each year we have more—and better—highways. In the future we will have more—and still better—highways." The South, where the population is not as great, and where wealth is not abundant, as in some sections, understands that its need of new citizens, immigration, increase in industry and appreciation of opportunity depends upon broader information. It appeals for personal inspection and naturally believes in good roads.

Florida is among the most progressive of Southern States in the matter of road construction. Here is realized the necessity for actual contact for appreciation. The visitor, coming down to Florida from anywhere in the country, finds it convenient and easy "to get about." Trunk lines and laterals and county roads and special district construction, all are reaching out to make a network of highways that will invite travel. And everywhere that a good road extends other improvements are quick to follow. Land values increase; attention is given to property that was neglected when approachable only by an old dirt road. The good road idea involves growth, presages prosperity, advance, satisfaction.—Florida Times-Union.

AMERICAN COMPANY SECURES ROAD CONTRACT IN GUATEMALA

(Continued from page 12.)

new material with the old roadway, conforming the subgrade to the required cross section. If the surface of the old roadway is of telford and conforms approximately to the surface of the finished subgrade, sufficient broken or crushed stone or gravel must be added to bring the said surface to the subgrade and required cross section. The warrenite bitulithic wearing surface will be laid on the foundation, as specified, to a thickness of 1.97 inches after thorough compression.

The work is scheduled to begin as soon as the contract has been signed and ratified by the President of the Republic. The time for completion is nine months, contingent on such unforeseen impediments as are out of control of the contractor.

The Government will allow the contractor to extract materials from the national quarries and sand pits, to be used exclusively in connection with this contract, free of charge. The Government obligates itself to secure the necessary right of way for the road. The contractor will be exempt from new taxes, and the Ministry of Agriculture is to be charged for the import and consular duties on the imported equipment necessary to carry out the contract. Preference is to be given to Guatemalan labor.

During the first five days of each month a measurement of the work done during the previous month will be made, and a certificate of payment for such month will be issued, computed at the above unit prices. The value of said month's work will be paid in cash during the first 20 days of the following month, with the exception of 10 per cent, which will be retained until the particular section of the work is terminated and paid to the contractor when the last payment for the section is made. All payments which are not made within the specified time shall draw interest at the rate of 8 per cent per annum until paid. In case of nonpayment or suspension of work by the parties to the contract, the contractor shall receive payment for the work completed and also appropriate compensation for the uncompleted portion.

In such matters arising out of this contract, the parties expressly waive the jurisdiction of the courts of their respective domiciles and accept the jurisdiction of the courts of Guatemala. The interpretation of the contract and the price appraisal on work not covered by it, but deemed necessary as an addition, shall be by mutual accord of both parties to the contract.

The equipment imported and to be used in the work consists generally of the following items: Miscellaneous office furniture and equipment, one 10-ton roller driven by gasoline, six trucks, three automobiles, one "60" tractor, one air compressor, one oil-storage tank, one portable asphalt plant complete with a capacity for 1,500 square yards, one set of apparatus for testing pavement, one set of tools for asphalt plant, one set of road tools for pavement work, one 25-horsepower locomotive-type boiler, one 6-ton gasoline-driven roller, one 50-horsepower electric motor, one rock-crushing plant, together with accessories and spare parts for the above-mentioned equipment.—Michigan Roads and Airports.

Status of Construction

THROUGH AUGUST 31, 1929.

Proj. No.	Contractor	Road No.	County	Total Length Miles	Clearing Miles	Grading Miles	Base Miles	Surface Miles	Type	Per cent Complete
6-A	Duval Engr. & Contr. Co.	1	Madison	5.56			5.56	5.56	S.T.R.B.	98.00
52	Robert G. Lassiter & Co.	1	Escambia	10.00				9.08	Concrete	85.00
64-A	H. E. Wolfe Const. Co.	17	Hillsborough	9.61				0.00	Concrete	0.00
64-C	H. E. Wolfe Const. Co.	17	Hillsborough	9.61				0.00	Concrete	0.00
518	Broadbent Const. Co.	5-A	Lafayette	17.57			15.97	0.00	S.T.R.B.	66.00
587	Duval Engr. & Contr. Co.	5-A	Columbia	4.43			4.12	0.00	S.T.R.B.	73.31
624	Manly Const. Co.	50	Hamilton	6.37			6.37	6.37	S.T.R.B.	100.00
644-C	L. B. McLeod Const. Co.	10	Wakulla	5.05			0.00	0.00	S.T.R.B.	0.00
669-Y	Kerr & Lawrence	27	Collier	13.55	13.55	13.01			Graded	93.00
669-Y	Wm. P. McDonald Const. Co.	27	Collier	3.00			3.00	0.00	S.T.R.B.	81.00
673	Robert G. Lassiter & Co.	1	Gadsden	14.97				14.98	Concrete	98.00
678	McVay Lindsay & Son	10	Bay	9.70			9.70	6.79	S.T.R.B.	93.00
685	State Forces	10	Franklin	18.46			18.46	16.48	S.T.R.B.	98.00
695	Manly Const. Co.	2	Lake	6.03			3.71	0.00	S.T.R.B.	44.00
706-A	Manly Const. Co.	28	Clay	1.14			1.14	0.00	S.T.R.B.	85.00
707	Leon County Forces	43	Leon	5.31	5.31	4.75			Graded	88.00
715	L. M. Gray	28	Union	5.27			5.27	0.00	S.T.R.B.	77.94
716	Duval Engr. & Contr. Co.	28	Bradford	11.21			11.21	0.00	S.T.R.B.	76.10
717	Manly Const. Co.	28	Bradford	10.93			10.93	0.00	S.T.R.B.	73.00
718	Duval Engr. & Contr. Co.	5-A	Columbia	8.22			8.22	0.00	S.T.R.B.	74.70
722	R. J. Carroll	48	Jefferson	8.83		8.66			Graded	98.50
724	State Forces	66	Leon	10.67	10.67	10.67		9.50	Sand Clay	96.00
726	State Forces	19	Dixie	12.59			7.82	0.00	S.T.R.B.	50.00
728	Robert G. Lassiter & Co.	10	Leon	11.76				.35	Concrete	.12
732	Gilbert & Hadsock	17	Polk	8.94	8.94	8.25			Graded	95.00
733	W. J. Bryson Paving Co.	33	Walton	4.23	4.23	4.02		4.07	Sand Clay	95.97
734	Penton-Mathis Const. Co.	40	Walton	7.90	7.90	7.90		7.90	Sand Clay	100.00
735	W. J. Bryson Paving Co.	40	Walton	13.72	13.72	13.03		9.08	Sand Clay	88.70
742	L. B. McLeod Const. Co.	13	Alachua	7.65			0.00	0.00	S.T.R.B.	0.00
743	Baker & Lewis	10	Bay	18.25			15.15	8.21	S.T.R.B.	77.00
749	L. B. McLeod Const. Co.	14	Gilchrist	7.81			5.54	0.00	S.T.R.B.	48.20
750	State Convict Forces	14	Gilchrist	12.97	11.67	11.67			Graded	88.30
750	L. B. McLeod Const. Co.	14	Gilchrist	.71			0.00	0.00	S.T.R.B.	0.00
751	W. J. Bryson Paving Co.	40	Walton	7.28	7.28	7.14		0.00	Sand Clay	65.11
752	W. J. Bryson Paving Co.	40	Walton	8.72	8.72	8.20		0.00	Sand Clay	63.20
755	B. Booth	17	Polk	11.22	11.22	11.00			Graded	98.00
766	State Convict Forces	10	Bay	8.74	8.43	7.75			Graded	70.00
781	F. W. Long & Co.	29	Okeechobee	11.00			6.00	1.50	S.T.R.B.	35.00
787	State Convict Forces	10	Walton	16.29	8.32	5.07			Graded	23.00
788	W. J. Bryson Paving Co.	10	Walton	17.54	8.23	6.65			Graded	36.60
798	State Convict Forces	13	Nassau	15.03	6.50	4.74			Graded	35.60
802-A	C. C. Hayes	10	Okaloosa	8.68	8.33	7.98			Graded	87.00
802-C	Curry & Turner	10	Okaloosa	10.24	9.93	9.22			Graded	81.00
803	Collins Const. Co.	10	Okaloosa	11.13	8.90	7.23			Graded	86.00
806-A	R. C. Huffman Const. Co.	25	Hendry	11.00	11.00	7.70			Graded	83.00
806-C	R. B. Stewart	25	Hendry	11.00	11.00	9.90			Graded	58.30
806-D	R. C. Huffman Const. Co.	25	Hendry	12.76	8.30	5.75			Graded	36.20
807-A	R. C. Huffman Const. Co.	25	Palm Beach	10.82	10.82	10.82	10.82	10.82	S.T.R.B.	100.00
807-C	R. C. Huffman Const. Co.	25	Palm Beach	6.13	6.13	6.13	6.13	6.13	S.T.R.B.	100.00
815	G. W. Byrd	54	Okaloosa	13.58				6.79	Sand Clay	50.00
820	H. D. Spangler & Co.	96	Jefferson	9.38	5.10	.57			Graded	11.00
821	H. D. Spangler & Co.	96	Jefferson	5.13	3.11	1.55			Graded	25.00
840	State Convict Forces	115	Walton	10.45	6.64	4.59			Graded	46.00
842	W. J. Bryson Paving Co.	115	Walton	10.15	9.34	5.38			Graded	54.00
844-A	State Convict Forces	115	Okaloosa	7.10	7.10	6.43			Graded	88.00
844-C	State Convict Forces	115	Escambia	5.63	5.63	4.85			Graded	85.00
845	State Convict Forces	19	Taylor	8.57	7.00	5.25			Graded	50.00
846	State Convict Forces	19	Taylor	11.00					Graded	
854	G. W. Byrd	60	Walton	9.81	7.90	3.81		0.00	Sand Clay	31.34
855	C. C. Moore Const. Co.	60	Walton	9.32	8.02	5.04		0.00	Sand Clay	47.15
863	L. M. Gray	56	Columbia	1.48	1.18	.74	0.00	0.00	S.T.R.B.	6.80
866	Cone Bros. Const. Co.	17	Hillsborough	.50			0.00	0.00	Asph. Blk.	0.00
Total complete August 31st, 1929					2912.18	2865.14	1496.70	2177.99		
Complete month of August					14.36	24.53	39.99	21.70		
Total complete July 31st, 1929					2897.82	2840.61	1456.71	2156.29		

TOTAL MILEAGE COMPLETE

	Concrete	Brick	B. C.	S. A.	B. M.	Asph. Block	S.T.R.B.	S.T.S.C.	S.C.	Marl	Total
Complete to July 31, 1929	310.2	17.13	39.75	114.75	109.75	23.20	1191.02	226.39	171.84	27.58	2231.25
Complete month of August	1.94						31.29		6.34		39.57
Complete to August 31, 1929	311.96	17.13	39.75	114.75	109.75	23.20	1222.31	226.39	178.18	27.58	2270.82

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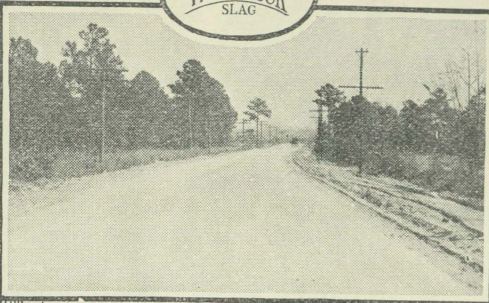
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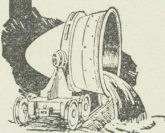
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ELIMINATION OF RAILROAD CROSSINGS, 1928, STATE SYSTEM

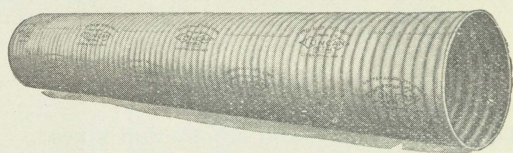
(Continued from page 20.)

State	Relocation	Overhead or Underpass	Total
Montana	21	4	25
Nebraska	13	—	13
Nevada	2	—	2
New Hampshire	0	0	0
New Jersey	12	2	14
New Mexico	8	2	10
New York	—	—	*34
North Carolina	12	9	21
North Dakota	29	4	33
Ohio	11	5	16
Oklahoma	20	12	32
Oregon	0	0	0
Pennsylvania	44	20	64
Rhode Island	—	1	1
South Carolina	41	16	57
South Dakota	4	5	9
Tennessee	—	1	1
Texas	20	5	25
Utah	6	2	8
Vermont	—	1	1
Virginia	15	9	24
Washington	14	—	14
West Virginia	14	2	16
Wisconsin	35	20	55
Wyoming	2	2	4
Total	703	263	*1,000

* New York—Character of elimination not designated.

—American Highways.

Woman Trips on Skirt and Falls.—Head-line. All we care to say about it is that she was some high-stepper.—Nashville Banner.

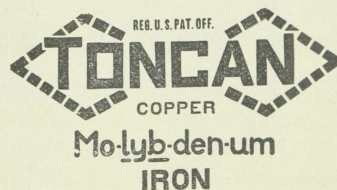


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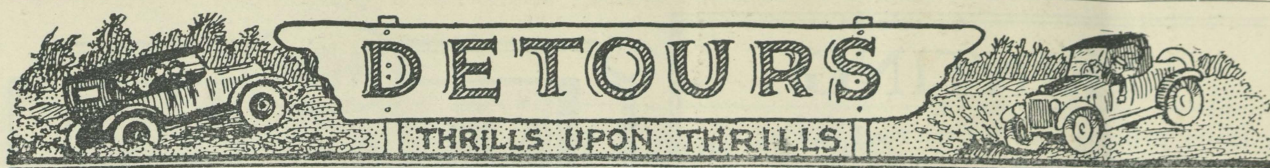
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"That man cheats," said a golfer as he entered the clubhouse.

"He lost his ball in the rough and played another ball without losing a stroke."

"How do you know he didn't find his ball?" asked a friend.

"Because I've got it in my pocket," replied the righteous one.

Fair Enough

She had done everything wrong. She had disregarded the signal lights, then stalled in the middle of the street, and before starting, had taken out her powder puff and started to apply it to her face. An irate traffic cop rushed up: "Say, lady, do you know anything at all about traffic rules?"

"Why, yes, what is it that you want to know?"

Children and Fools

"Yes, it is really remarkable," observed mother at the head of the table. "Clifford seems to eat twice as much chicken when we have visitors."

"Indeed!" exclaimed the lady visitor. "And, pray, why is that, Clifford?"

"'Cause that's the only time we have it!" replied the truthful lad.

Faddy Customer—"I don't like the look of that haddock."

Fishmonger—"Well, madam, if it's looks you're after, why don't you buy a goldfish?"—Le Rire.

The Happy Fireside

The cricket is on the hearth, dear,

There's your pipe and a book that's new;

Your slippers are by the fire, dear,—

But where in hell are you? —Life.

"I can't marry you," said the justice of the peace to the nervous bridegroom. "If this girl is only seventeen you will have to get her father's consent."

"Consent!" yelled the groom. "Say, who do you think this old guy with the rifle is, Daniel Boone?"

Services Required

The late "Bob" Taylor, who was called the "pardoning governor," told the following story of an old colored woman who came to him while he was Governor of Tennessee:

"Marse Govenah, I want my Sam pahdoned," said she.

"Where is he auntie?"

"In de pententiary."

"What for?"

"Stealin' a ham."

"Did he steal it?"

"Yes, sah, he suah did."

"Is he a good nigger, auntie?"

"Lawdy, no, suh. He's a pow'ful wo'thless niggah."

"Then why do you want him pardoned?"

"'Cause, yo' honoh, we's plum out of ham ag'in."

Artist—"This picture took eight years of work."

Friend—"That's a long time to devote to one painting."

Artist—"Well, it took six days to paint it and the rest of the time to sell it."—Pearson's Weekly.

Mrs. Decollette—"Have you noticed that my new party gown is longer than the others?"

Husband (giving her the o. o.)—"Longer? You must refer to the shoulder straps."—Boston Transcript.

Here, There, Everywhere

A group of tourists were looking over the inferno of Vesuvius in full eruption.

"Ain't this just like hell?" ejaculated a Yank.

"Ah, zese Americans," exclaimed a Frenchman, "where have zey not been!"

Squirrel's Cage

"When are Joan and Ed to be married?"

"Never, I'm afraid."

"Why, how's that?"

"Well, she won't marry him until he pays his debts, and he can't pay his debts until she marries him."—Boston Transcript.

Squelched Simpleton

There is a story of a visit John Barrymore paid to a haberdasher in Hollywood. After ordering this and that, he turned to leave.

"And your name?" the clerk asked innocently.

"Barrymore," was the chill reply.

"Which Barrymore, please?"

John surveyed him coldly. "Ethel."—Richmond Times-Dispatch.

When the Twain Almost Met

"I went out West in '89," said the New Yorker.

"How fur d'yu git?" queried the miner.

"Buffalo," said the New Yorker.

"I went East th' same year," said the miner. "Went as fur's Butte, Montana. Nearly ran into each other, didn't we?"—New York Times.

Weeps on Her Shoulder

Mrs. Dryren—"Do you find your husband much improved under national prohibition?"

Mrs. Wetmore—"Quite the contrary. Formerly he told his troubles to the bartenders. Now I have to listen to them."—Detroit News.

Damaged Deacons

How the pastor talked to the highwaymen who sought the cash that he did not have: "Ah, gentlemen, I might, indeed, have something to give you if only I had such energetic fellows as you to pass the plate now and then."—Christian Register.



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Every year more than a MILLION sq. yds. of hard surface roads and streets are laid with basic slag. Doesn't that prove, on the face of it, that the cost of

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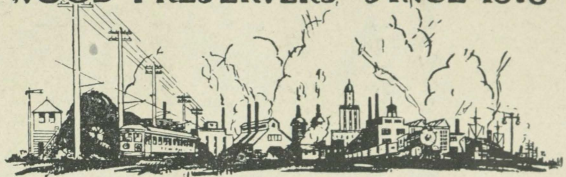
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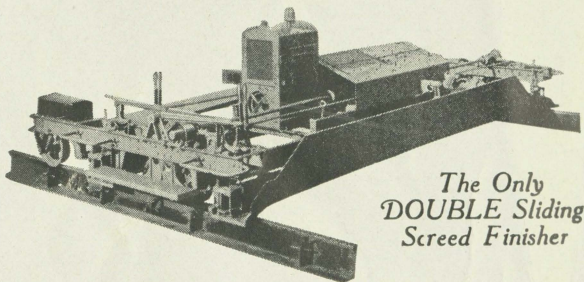


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Greedy traffic requirements make short work of road appropriations . . .
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. . . between new mileage built of high-cost construction, and new mileage built of low-cost construction—bearing in mind that low-cost construction with Tarmac permits five times the mileage obtained under high-cost methods

. . . between the type of pavement required for congested main thoroughfares, and the improved surfaces demanded for the fast-multiplying traffic of secondary roads and streets.

Tarmac is used for Surface-treating (cold and hot), for mixed-in-place construction, for penetration macadam, and for patching and crack-filling.

Tarmac MIXED-IN-PLACE construction is one low-cost type which helps you balance your road program. Utilizing local aggregates, its simple method of construction provides smooth-riding, skid-proof wearing surfaces for main highways or secondary roads and for streets.

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